

THE IRON AGE

New York, April 10, 1919

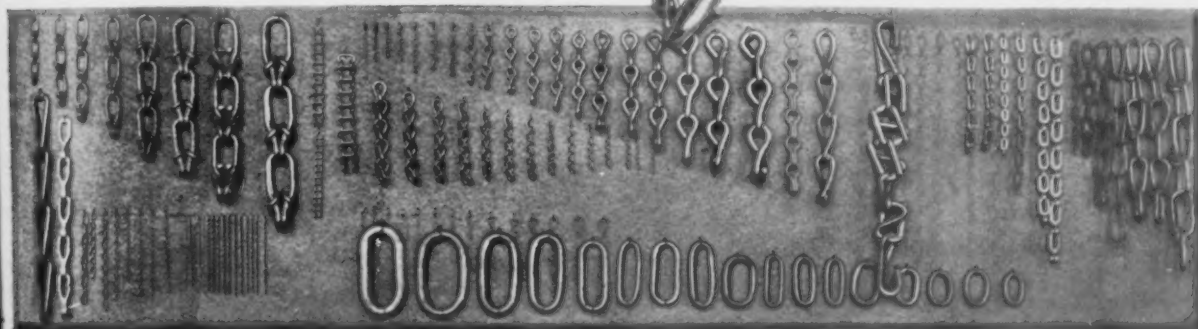
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The Business of Making Small Chain

Administrative
Problems Facing
the Newcomer in

This Field
of Special
Manufacturing
BY E. R. MINER*



CHAIN has so many and various applications that the production is steadily on the increase, its manufacture usually highly profitable and its sale comparatively easy. It is replacing leather, fabricated products, solid rods, wire, rope and cable. In a thousand ways, where trial has shown some advantage as to wear, strength, use or cost, chain is taking the place of other materials. It would seem that new markets are ever ready if a firm can supply the goods; the field appears inexhaustible, and hardly a day passes but some one presents a new outlet for this every-day article. There are two totally distinct fields: (1) The light chain market, or everything of a size which allows the use of automatic machinery for making the chain; (2) the heavy or wrought chain market, that includes those larger sizes of chain where each link is handled more or less as an individual operation.

As a commercial proposition, the manufacture is most interesting on those types and sizes that have the largest natural demand, can be made automatically by machinery at little cost for labor, which consequently guarantees not only a large quantity production with small overhead charges, but a steadiness of output that is little disturbed by the usual manufacturing difficulties and questions. These conditions of demand and automatic manufacture are met most fully by sizes that can be covered by metal up to and including $\frac{1}{2}$ in. in diameter. Such sizes would represent approximately 75 per cent of the market.

Opportunities

As a business the manufacture of chain offers opportunities that can be grasped by any fairly well organized sales force. As a strictly manufacturing problem, the making of chain, within the limit of sizes suggested, is a comparatively simple proposition.

There are no trade secrets, no requirements for a highly specialized type of knowledge, no labor needs that cannot be easily and fully supplied through regular and local channels.

In considering chain the question of sales is closely connected with the question of plant equipment. To decide upon making chain is not sufficient, for there are some thousands of different uses for chain, each distinct use calling for a particular kind or size. It becomes important, therefore, to determine what field of activity it is desirable to take up, so that sizes and type of chain may be decided upon.

Chain being a familiar article of general use, it would be a waste of time and space to enter into technical details of construction. The object is to present the subject of chain making as a problem for the executive department, covering those points that will give a thorough grasp of the business as a whole and omitting much that is purely a question of mechanical detail and readily gained by purchase of equipment and employment of labor.

What Constitutes Small Chain

Suffice it to say, that ordinary chain made on automatic machinery, meaning anything up to $\frac{1}{2}$ in. in diameter, is produced from what is termed wire, the flat metal chain from ribbon metal. Both the wire and ribbon metal is purchased in coils and feeds into the machine from a reel. The smaller the chain the greater the length of wire or ribbon metal in one of these coils and the longer the machine will run without the attention necessary to bring new coils to the machine. One man might attend to six small chain machines, whereas he could only adequately manage two of the larger sizes.

In the nomenclature of the trade anything is a wire that can be coiled. When it gets beyond the coiling stage it becomes rod or flat sheet. The flat

*With the Baird Machine Co., Bridgeport, Conn.

ribbon stock is called wire, and specifications would ordinarily read wire of some certain thickness and width. The definition of a chain would be, assembled and connected links made from wire of specified dimensions and design. The metal of the link may be round, half-round, flattened on two sides, square, flat or any other shape, but it is all wire, metal that feeds into the machine from a coil. To go into detail as to size and kind of wire used would give but little worth-while information.

Fundamentals

The manufacturer contemplating the making of chain must first reach a decision on the following points:

1. Type of chain he wishes to make, including the shape of the wire he wishes to employ.
2. Sizes of each type.
3. Strength that each size should have as a standard.
4. Selection of wire stock, according to shape, size and strength.
5. Kind of chain-making machine and tools that would be fitted for operating upon the materials selected.

The selection of these factors would be governed by an examination of the chains now upon the market, a study of the trade to be supplied, or possibly the specifications of some patent acquired. In any event the purchase of chain-making equipment would be governed absolutely by samples of chain and not by printed tables of sizes and kind.

The Magic of a Trade Name

Chain is not only produced in great variety of styles and sizes, but the same style of chain is often known under several different names. Three factories making identical chain may have each created a trade name for their product, and each one will hold the good-will of his individual trade through publicity that has produced a demand for that chain by name. In such case it is a matter of self-protection to have the chain marked in some way that is easily identified by the buyer. This could be done on the links, but it is more often done by crimping a soft metal tag to one of the links for every so many feet of chain. Problems of this kind belong to the sales and advertising departments rather than to the manufacturing end of the business.

Regular trade names for various chain are: Single jack, double jack, ladder, triumph, Oneida, brown, bull dog, Niagara, sash, trap, toilet, plumbers, hoist, safety, jewelers, flat metal, flat link, trace. These general names are more or less misleading, as in different parts of the country a "safety" chain, for instance, might be any one of several entirely different types. In the illustration there is shown all the common styles of chain.

Marketing Chain

In marketing chain the same general sales principles hold good that would be applied in the marketing of any other product. In looking over the field there will be found a great deal of cheap stuff made from poor and weak metal. This is unbranded chain from factories unknown to the consumer. Purchased for a miscellaneous number of purposes, it probably gets by in over 50 per cent of the uses to which it is put, but there is always that part of the trade that must have, for some special use, chain of a guaranteed strength and reasonable lasting quality. There is that other trade that knows quality is always a better buy than mere price.

The percentage of buyers who must have, or who prefer buying, the quality goods is much larger

than manufacturers generally realize. This body of quality buyers can easily be added to by a policy of publicity that educates the careless buyer to recognize that the usefulness of chain nearly always depends upon its strength and the length of time it will last when subjected to the wearing conditions for which it is proposed to use it.

Nearly every dog owner has had the experience of purchasing a chain that the dog broke, always at a time when he could be accused of some neighborhood mischief. The farmer has had his cattle or horses get away, his load tumble off a wagon, or some other experience connected with the weakness of a chain. Manufacturers, contractors and other users of chain have all had such experiences, and at times costly accidents. These things need not be argued, reminders are amply sufficient. After these experiences the dog owner buys a much larger, more awkward and often, in comparison with the dog, clumsy-looking chain, the farmer goes in for bigger sizes and heavier links, the manufacturer and contractor follow the same idea. In a majority of cases these larger sizes are cumbersome, they are not, for that reason, satisfactory and they could be replaced by much smaller chain that was made in a specified manner from guaranteed material. Anyone can understand that a chain made from lead would not hold much. Under tension the links would open up at the joints and pull apart. Soft iron will do the same thing; it is only a question of degree as regards tension.

The temptation for manufacturing cheap grades lies in the fact that it does not require selling—there are always cheap goods houses ready to buy anything that looks all right and is offered cheap enough. A further temptation is the fact that this soft metal is less wearing on the tools and the machines can be speeded up to the limit; also, the wire can often be picked up as jobs, condemned lots or for some other reason, cheaply.

Value of a Well-Regarded Trademark

A solid, substantial, lasting and profitable chain business should rest upon a foundation of quality in material used, and in links that are individually well formed and collectively well put together. Starting on this basis, a simple, easily pronounced and easily remembered "trade name" should be originated.

Suppose the name selected is "Victoria." This same name should be used for every type, size and kind of chain made that stands for quality. It is a mistake to have several trade names, if each grade is about equal. Concentrate! Make the buyer understand, and force him to the final conclusion that "Victoria" chain of any kind or description is good chain—chain that can be relied upon.

To distinguish the types it is only necessary to hook up the common names as "Victoria trap," "Victoria sash," etc. Mark the chain in a manner that leaves no doubt about identification. This could be done by stamping some trade name or symbol on the links, by crimping a metal tag to every given number of links, by painting every twenty-first link red, or by any other likely method.

A good identification mark should lend itself easily as an advertising slogan thus:

"Victoria"—The chain with the red link.

"Victoria"—Look for the word "Vic" on each link.

"Victoria"—Count twenty and look for the soft brass tag.

As "Victoria" chain, not just chain—every sale helps to create a market. As trade-marked goods "Victoria" means just one particular chain made by one individual manufacturer. To the consumer

"Victoria" means the use of the smallest and most easily handled sizes for this purpose; the name stands for reliability, service and the thing wanted.

Sales mean continued business along profitable lines and not price cutting. It is one manufacturer's business. Sales under these conditions mean selling, not taking orders. Depending upon the sales department, coupled with publicity, advertising or promotive work, a company can be a leader and reach a total of business running into a whole row of figures, or it can exist by waiting for the possible customers to look them up and "beat a pathway to their door." It is all in the point of view. Theoretically it carries a sense of personal gratification to have people hunt you out, keep the path open and all that. Practically, it doesn't work out in the long run in this manner. Too much grass grows on the pathway and too many tall weeds get pushing over to obstruct and confuse the direction.

On the whole, if we have a "good thing" we prefer to "holler about it," build a nice wide asphalt pavement of publicity leading up to it and go out on the highways and byways of business and yank the unregenerate onto the asphalt. For this kind of quality manufacturer there is: (1) The regular chain trade; (2) the special trade, or those manufacturers and others requiring chain to use as a part of their product; (3) the created market or

new uses that can be found where chain may replace some other material.

The first two of these fields have already been pointed out, but consideration may be profitably taken of the new uses for which may be developed.

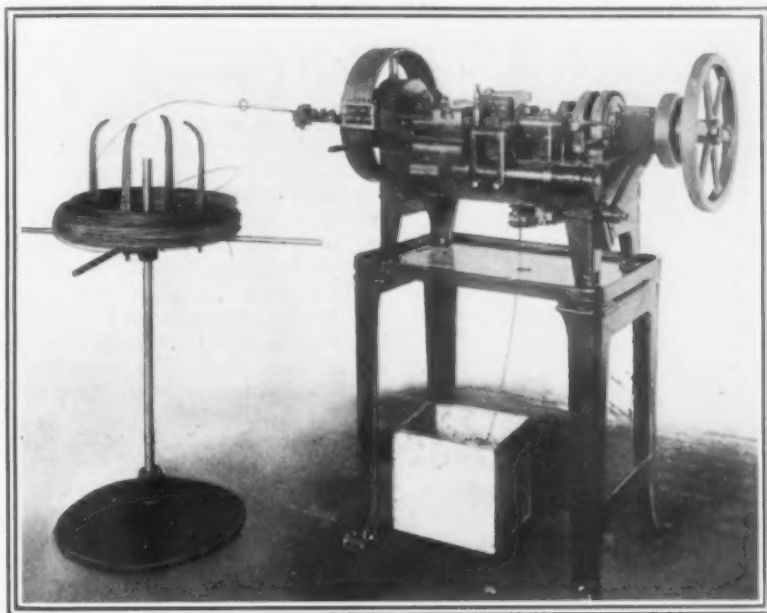
Ever go up a ladder or up steps guarded by a flexible hand rail? It doesn't matter whether these steps were on shipboard or on land; remember the hand rail. It used to be rope. These days it is

more often chain. It may be bare, or it may be covered with a rubber hose or a canvas tube, but in a majority of cases it is chain. Someone discovered this outlet for chain, and now there are many thousands of feet used for the purpose each year.

Another little seeker after hidden things noticed an electrical apparatus in a department store. There was one small part that was removable, and the clerk had carefully tied this

part to the rest of the outfit by a string about 10 in. long. Plenty long to allow removal and plenty short to prevent loss. This whole incident was put up to the manufacturer of the electrical equipment accompanied by several samples of small chain. Today this removable part is fastened by 6 in. of nickel chain—hardly any additional cost on a single instrument, but amounting to over 50,000 ft. of chain on a year's output.

There are always markets, but there are not always salesmen.



Chain-Making Machine of 80 to 200 Links Per Min. Capacity

FOREIGN TRADE CONVENTION

Sessions Will Be Held in Chicago, April 24 to 26—Mr. Farrell Will Preside

When the fifth convention of the National Foreign Trade Council was held in Cincinnati last April the main theme was "The Part of Foreign Trade in Winning the War." This year, however, different conditions prevail, and the general theme of the convention, which will be held in Chicago, Thursday, Friday and Saturday, April 24 to 26, will be "Foreign Trade Essential to American Industry." All general sessions will be held in Orchestra Hall, 216 South Michigan Avenue.

James A. Farrell, chairman National Foreign Trade Council, will call the first general session to order Thursday morning. The following addresses will be made: "The Effect of Increased Productive Capacity Upon Our Foreign Trade," Edward Prizer, president Vacuum Oil Co.; "America's Financial Equipment for Foreign Trade," Fred I. Kent, vice-president Bankers' Trust Co.; "The Interest of Labor in Foreign Trade," Hugh Frayne, War Industries Board; "The Element of Labor Cost in American Exports," William Pigott, president Seattle Car & Foundry Co.

In the second general session, Thursday afternoon, Hon. William S. Culbertson, U. S. Tariff Commission, will speak on "The Bargaining Tariff," and J. W. Hook, president Allied Machinery Co. of America, will speak

on "The Stabilizing Effect on American Industry of a Definite Foreign Trade Policy."

At the third general session, Friday morning, the American Merchant Marine will be discussed by a number of speakers. In the group sessions Friday afternoon, Foreign Credits and Credit Information, Direct Selling and Representation, and Export Combination, will be considered. Andrew Young, traffic manager American Sheet & Tin Plate Co., will read an address on "Inland Traffic Management for Export."

At the banquet, at Congress Hotel, Friday evening, James A. Farrell will speak on "American Maritime Policy," and Hon. Frank C. Lowden, Governor of Illinois, on "The Meaning of Foreign Trade to the Middle West." Hon. Breckinridge Long, Third Assistant Secretary of State, will speak on "The Relation of Diplomacy to Foreign Trade." Edward N. Hurley, chairman U. S. Shipping Board, will speak on "The Future of Our Foreign Trade."

In the Saturday morning session, reports of group sessions will be received, as will also the report of the general convention committee.

Rudolph E. Lee of Clemson College, S. C.; T. MacEwan, of Pittsburgh, and A. R. Turnbull, of Charlotte, N. C., have opened offices at 1214 Realty Building, Charlotte, N. C., for the practice of architecture and engineering under the firm name of Lee, MacEwan & Turnbull. A. R. Turnbull is the general manager. The firm will be glad to receive catalogs.

GASES OCCLUDED IN STEEL

Composition, Volume and Effect on Properties— Temperatures of Evolution and Critical Point

At a general discussion on the occlusion of gases in metals, at a recent meeting of the Faraday Society (British), at which Sir Robert Hadfield presided, a paper, "Gases Occluded in Steel," was presented by Dr. Thomas Baker. An abstract follows:

It is well known that iron and steel are capable of holding in solution or otherwise considerable quantities of gas, and that these are often far from negligible. Many investigators have attacked the problem with the object of ascertaining the composition and volume of these gases and their effect on the physical

Table 1—Analyses of Steel Used in Experiments

	C. Per Cent	Sil. Per Cent	Mn. Per Cent	S. Per Cent	P. Per Cent
Solid ingot	0.90	0.088	0.096	0.023	0.019
Ingot with blow-holes	0.81	0.080	0.050	0.028	0.019
Soft steel ingot	0.13	0.011	0.370	0.053	0.075

properties of the metal, but little is known on this beyond the part they play in the production of blow-holes, and in a peculiar kind of brittleness which is developed by pickling.

Some years ago the author carried out an investigation with the above-mentioned object and also to discover the relation, if any exists, between the temperature of evolution of the gas and the critical points of the steel. For this purpose two crucible steel ingots, about 6 cm. sq., were prepared in such a way that while one was free from blow-holes the other contained as many as possible. In addition to this there were also obtained some samples of dead soft steel, such as is employed in the manufacture of tin-plates. The chemical analyses of these three samples are given in Table 1. The solid ingot contained also 0.033 aluminum.

The apparatus employed for the extraction of the gases consisted of a porcelain tube glazed internally and externally, and closed at each end by rubber stoppers. Through one of these passed a glass tube, making connection with a Torplur mercury pump, and through the other two glass tubes into which the leads from the thermocouple were fused. An electric resistance furnace was employed to heat the tube, and, in order to prevent undue heating of the rubber stoppers, the ends of the tube were water-cooled. The temperatures were determined by a thermocouple used in connection with a millivoltmeter.

Before starting an actual experiment, it was thought advisable to run a blank; the pump failed to extract anything out of the tube. It was next heated for nine periods of 8 hr. each to a temperature of about 1000 deg. C. and exhausted at the end of every third period.

Table 2—Composition of Gases Extracted at Various Periods

	Volume in c.c.	CO ₂ Per Cent	H ₂ Per Cent	CO Per Cent	CH ₄ Per Cent	N ₂ Per Cent
First period ...	0.84	15.48	40.00	...	19.05	25.47
Second period ..	1.15	18.25	52.20	11.22	5.48	12.78
Third period ...	1.18	4.23	73.22	13.55	5.93	3.13

The composition and volume of the gases obtained in these experiments are embodied in Table 2. No correction has been made for these gases in the results on the gases obtained from the various samples of steel.

It is interesting to note that Fox found that thoroughly dried oxygen, when swept through an otherwise empty redhot porcelain tube, persistently yielded small quantities of water—3.5 mg. during the first hour, 0.7 mg. from the twelfth to fourteenth hours.

A piece of one of the steels, weighing about 60 grams and having a thermocouple inserted in one end, was next placed in the tube, the latter exhausted, and the vacuum maintained for 48 hr. before starting

the heating of the tube. After again exhausting the tube, the experiment was commenced and continued over 10 days, the period of heating being 11 hr. per day; and at intervals during each day the gas was collected and analyzed. The volume and composition of the gases are given in Table 3 in the original paper. In the case of the steel with blowholes, as many as possible were cut open in order to allow the gases contained in them to escape, the object being to obtain the gases from the solid portion of the steel, leaving those contained in the blowholes for a future investigation.

Some further experiments were carried out to ascertain the effect of such operations as annealing and mechanical work on the volume and composition of the gases. A piece of the sound steel was annealed at a temperature of about 1200 deg. C., and the gas extracted in the manner already described; no marked changes were observed in either the composition or volume of the gases. No numerical results are given for this experiment, since they are simply a repetition of those already given for the same steel in the untreated condition.

In order to investigate the effect of mechanical work, an ingot from the same cast of soft steel as that already employed was rolled down from 9 in. sq. to a plate 9 in. wide by ½ in. thick, and a piece selected from a position corresponding as nearly as possible to that of the piece from the first ingot. The results of this experiment are embodied in Table 4 in the original paper.

In Table 5 the results of all the experiments are collected. From these it appears that the composition is practically the same throughout the series, but that the volume varies considerably. In the case of sound

Table 5—Results of All the Experiments

Description	Weight of Steel, gm.	Volume of Gas per gm. of Steel, c.c.	Volume of Gas, c.c.	Average Percentage Composition				
				CO ₂	H ₂	CO	CH ₄	N ₂
Sound steel	69.3	1.32	91.86	1.68	52.00	45.53	0.72	0.87
Sound stl. reheated	47.3	1.40	66.54	1.16	49.55	45.99	2.71	0.59
Steel with blowholes	42.1	0.66	63.20	0.88	54.56	42.36	1.73	0.47
Soft ingot	66.6	1.03	68.84	1.18	52.12	45.64	0.73	0.32
Bar from soft ingot	67.7	0.53	36.25	0.91	49.08	48.12	0.11	1.77

The thermal critical points of these steels occur at the following temperatures:

	Ac ₁	Ac ₂	Ac ₃	Ar ₁	Ar ₂	Ar ₃
Sound steel and steel with blow-holes	746°			693°		
Soft steel ingot and bar	722°	758°	867°	682°	760°	846°

steel and steel with blowholes, the variation in quantity is easily explained, since the latter before and while solidifying would boil off the greater part of the gas. In the case of the soft ingot, which also contained an outer ring of blowholes, a smaller quantity of gas might reasonably be expected when compared with the sound steel. It is also evident that a mechanical operation such as rolling squeezes out a very considerable portion of the gas, which in the present case amounts to about one-half.

With the hard steels, hydrogen reaches a maximum rate of evolution at 600 deg., and below this temperature constitutes the greater part of the gas given off. Carbon monoxide is slowly evolved from the beginning of the experiment, and reaches its maximum rate of evolution at 688 deg., a temperature which agrees fairly well with that of the Ar_{1.23} point. With the soft steel, hydrogen again forms the greater portion of the gas collected at temperatures up to 660 deg., and presents a maximum rate of evolution at 609 deg. It, however, differs from the hard steel in that it has a further maximum at 786 deg., the temperature at which the carbon monoxide also reaches its maximum rate of evolution. This latter temperature is about midway between the A₂ and A₃ points. Whether these gases are the ones evolved from the steel or are formed by interaction between those actually evolved is a problem that still demands solution.

Gray Iron Castings from Electric Furnace*

Duplexing with the Cupalo—Unusual Qualities Bestowed on the Iron by Superheating and Refining Electrically

BY GEORGE K. ELLIOTT

THE central facts and fancies embodied in this paper are either taken from or inspired by divers experiences with a basic-bottom, Héroult electric furnace at the plant of the Lunkenheimer Co., Cincinnati, Ohio, extending over a period of nearly two years.

The aggression of the electric furnace into the field of steel castings has been widespread and irresistible; but, so far, the homely gray-iron casting has been beneath its exalted attention. Or, is it that the cupola furnace, venerable and efficient to a remarkable degree, has been a citadel too mighty to be overwhelmed by the invasion of the electric furnace, as were the established furnaces of the steel foundries? However, it may be, the author believes the electric furnace has a fair chance to break into the domain of iron castings, at points in the line where the hammering of modern engineering for super-grades of castings is rapidly effecting a perceptible breach.

In regard to gray-iron castings, it cannot be denied that to-day there are classes of castings for which the insistent demand is for physical properties of a higher order than are commonly characteristic of such iron. Possibly every branch of engineering has some castings that should be, and sooner or later may have to be, made of better gray iron than is now used. Only a few such instances will be given. One case, and the direct cause of the experiences here related, is that of steam valves for high-pressure and superheated steam. Both pressures and temperatures of the steam used in power plants have passed through a period of exceptional growth, placing upon the apparatus for handling steam severer demands than ever before. Similar is the case of cylinders for locomotives using superheated steam. Also there is the case of cylinders for internal combustion engines.

Prime Qualities Existing and Demanded

The two prime qualities most generally wanted in high grade gray cast iron are strength and solidity, properties which usually are concurrent. The best strength gray iron shows is when under compression, and its worst, under impact and vibration; between come transverse strains and tension. If the cases are studied in which unusual strength of iron is required, it is discovered that almost always the castings are to be used where they will be subjected to either impact, vibration, or tension; or, in fact, where cast iron is at its greatest disadvantage.

Under the head of solidity may be included a number of related items such as density, closeness of grain and freedom from subcutaneous imperfections such as slag inclusions, graphite segregations, blow-holes, shrink-holes, and the like. Solidity is an excellent goal for the aspiring foundryman; but, in going after high specific gravity he has to beware that he is not lured out from the realm of true gray iron into the dangerous domain of mottled and white irons where brittleness lurks to impair the impact strength of castings and hardness to ruin their machinability.

Strong irons without exception require high pouring temperatures because they have high melting points and minimum fluidity. The irons most easily melted and, consequently, the most fluid ones, have high percentages of phosphorus in their make-up. Medium and high phosphorus irons comprise by far the greatest part of the melt of the gray-iron foundries of the country.

They are the popular casting irons; and it is no extravagance to say that phosphorus has done as much or even more than any other element to popularize gray iron for castings. Still, phosphorus has the grave fault of unfavorably affecting the strength of iron, a thing it accomplishes by forming in the iron mass a network of structurally free phosphide which is quite brittle. Although easily fluid, high phosphorus irons are brittle and generally lacking in strength; conversely, tenacious, strong irons are necessarily low in phosphorus.

Limitations of the Cupola

The great fact that strength and fluidity do not go hand in hand brings to light the greatest defect of the cupola furnace—its thermal limitations. It is the foundryman casting strong iron who knows best these limitations. The complete melting operation as it takes place in any furnace is divided into three obvious stages—preheating, melting proper and superheating. For the first two, the cupola is the furnace pre-eminent; but for superheating it is not the same paragon of excellence.

All ordinary grades of gray iron—those with medium and high percentages of phosphorus—cannot be melted more easily or more economically than in the cupola. For melting efficiency this furnace takes precedence over its two closest rivals—the reverberatory or air-furnace, and the regenerative open-hearth furnace. For simplicity of construction, low cost of installation and upkeep, ease of operation, and economy of melting, it has no real competitor; and there is no probability that, for the great run of ordinary gray-iron castings, it ever will be displaced, although its improvement is conceivable. From the standpoint of process alone, the cupola is almost impeccable; but, from the high ground of product, it shows serious faults. The two worst of these are its weakness as a superheater for molten iron, and its incapacity as a refiner. The cupola is not a refining furnace and sometimes its hottest possible iron is not hot enough for the best casting results.

Duplexing in the Iron Foundry

Duplex processes are well established and of excellent repute among makers of steel; but, for the production of gray iron, they have been entirely neglected, leaving virgin a promising field for development in the making of molten iron for the highest grade of gray-iron castings. For a supplemental furnace to the cupola, there are several eligible types. Among these are the reverberatory furnace, the regenerative furnace, and the electric furnace. The air furnace, the author hardly considers sufficiently suited to the work. The regenerative furnace promises better, especially where a large tonnage is to be handled at one time. Still, in the end, the author believes the arc electric furnace presents the most alluring possibilities for really extraordinary castings.

The foundry with which the author has been connected has made a specialty of high pressure steam valve castings with extreme solidity exacted, and the tenor of his experiences there has been such as to prejudice him strongly in favor of the basic-bottom arc electric furnace as the best auxiliary for the cupola in a duplex process for the production of truly high class gray-iron castings.

At this point we anticipate the question as to why the basic furnace is preferred. If superheating only is desired, it is entirely probable that the acid furnace should be given the preference; but if an important

*From a paper, "Improving the Quality of Gray-Iron Castings by the Electric Furnace," presented at the thirty-fifth general meeting of the American Electrochemical Society, New York, April 4, 1919. The author is chief chemist and metallurgist Lunkenheimer Co., Cincinnati.

amount of refining is advantageous, the basic furnace should be used. It is true that the acid arc electric furnace exerts a considerable refining influence by virtue of the reducing condition so readily maintained in it. On the other hand, the refining tendency of the basic furnace is so much more pronounced and so readily responsive, that the iron charge is perforce refined at the same time it is being superheated. By the time the charge has reached the pouring temperature it also has reached a highly refined condition; and, among other results, the sulphur has been reduced very materially, provided, of course, the proper basic and reducing slag has been maintained.

Sulphur and Its Removal

Sulphur in cast iron has so long been considered a necessary evil that its presence not only is commonly condoned, but occasionally is credited with certain benefits. No doubt there are a few of these last, for instance, where it aids in producing chill; but, in general, there is good reason to believe that iron is much better for its absence. That it induces unsoundness when in excess is general knowledge in foundries specializing in castings of a solidity that is a matter of severe test; high pressure valves are an example. Sluggishness of metal is a closely allied evil that travels in the train of sulphur and works unfavorably to solid castings.

A medium or high sulphur content is inevitable in the product of the cupola furnace, while in the basic electric furnace its practical elimination is almost a matter of course. The basic electric furnace removes most of the sulphur while the metal is being superheated. This reaction makes possible for the electric furnace certain obvious compensating economies in the choice of raw materials used in the cupola phase of the process. Iron coming from the cupola with 0.100 per cent sulphur, after undergoing about 25 min. heating in the basic electric furnace under the proper reducing slag generally will contain about 0.030 per cent. One heat the author has in mind was reduced from 0.099 sulphur to 0.022 per cent and another from 0.088 to 0.018 per cent. This possibility of so low a sulphur in gray-iron castings may possibly open up a new field for metallurgical investigation.

Carbon regulation, total as well as combined and graphitic, is possible to a most useful extent in the electric furnace. By placing steel scrap in the furnace before adding the molten iron from the cupola, total carbon can with accuracy be reduced to any desired extent. By this simple, unfailling means, gray iron of the so-called semi-steel quality may be obtained with great uniformity of composition, structure, and strength. Uniformness among different heats, homogeneity in the individual heat, close carbon regulation, and unlimited temperature, are a quartet of benefits of the electric furnace that make possible a realization of those exceptional qualities so often claimed for and so rarely reached by those cupola-compounded mixtures that are pleased to go under the name of semi-steel. Correctly balancing the combined and uncombined carbons also is a matter of no great intricacy in the electric furnace by the vicarious means of the silicon content. Indeed, the capricious vagaries of the cupola with reference to carbon control, are replaced in the electric furnace by substantial certainties.

Alloy Additions Possible

Another advantage accruing from the electric furnace is the possibility of making furnace additions of manganese and other elements for particular purposes, without having to expect more or less appreciable losses; the manganese losses are *nil*. Other benefits there are, but they are of a well-known order, so that their repetition here would be commonplace. The one big advantage from the standpoint of composition is the absolute control of mixture, making duplication of results more a matter of correct calculation and less the effect of happy accident.

A concrete example of results actually obtained in everyday running practice may be of interest. A rather

ordinary mixture of pig iron and foundry scrap was melted as usual in the cupola, transferred to a basic electric furnace and there superheated and refined under a lime slag. The untreated iron was of a composition regularly giving standard "arbitration" test bars that broke under an average transverse load of 2950 lb. (1350 kg.) with a deflection of 0.10 in. (0.25 cm.). After treatment in the electric furnace, the iron gave the same kind of bars breaking at slightly over 4400 lb. (2000 kg.) and at a deflection of 0.115 in. (0.29 cm.). The specific gravity was increased from 7.10 to 7.25. About 25 min. was the time of the electric furnace treatment, and the current consumption was 104 kw.-hr. for 2000 lb. (910 kg.) of iron.

Possibilities of the Dual Process

At the beginning of the paper the author indicated several concrete cases which seemed to justify this proposed dual process, and now before closing he wants to define broadly some classes of iron castings for which it may be feasible. In the first place, there are those castings for which there is exacted unusual tenacity, solidity and other physical properties. Secondly, there are those castings that are difficult to run on account of having thin sections and relatively large sizes. Thirdly, there are those castings of high quality whose extreme foundry cost is but a very small part of the total cost of the finished article. For the moment, leaving the cupola, attention may well be called to possible advantages in using the electric furnace in connection with the direct metal from the blast furnace, the electric furnace filling the triple rôle of mixer, superheater, and refiner. Such process would make possible high class gray-iron castings almost direct from the blast furnace at a cost very little higher than that of ordinary cupola iron.

To conclude, the author wants to emphasize the fact that the cupola and electric furnace duplex process for gray iron is not recommended by him as a commercial practicability for ordinary iron castings under ordinary circumstances, but rather as a convenient and extremely efficacious substitute for the cupola process for extraordinary castings or for extraordinary circumstances.

Chromium and Tungsten Magnet Steels Compared

A good deal of research work on magnet steels has been conducted at the Reichsanstalt in Germany during the war; a part having been published in the *Wissenschaftliche Abhandlungen*, but only a part, according to London *Engineering*. One of the points investigated is the substitution of chromium steel for tungsten steel. Bar magnets of chromium steel, stored for a year without being exposed to any disturbance, kept their magnetic moment constant within 0.3 per cent and less. In all the cases the changes observed were within the limits of the experimental error in the second half of the year. As regards constancy to heat variations and concussions and temperature coefficient the chromium steel proved equal to tungsten steel; in coercive force and remanence, the best chromium steel did not come up to the best tungsten steel. The temperature coefficient of the magnetic moment diminishes with increasing content of dissolved carbon and was found to be zero in a 1.40 per cent carbon steel.

To investigate the suitable ratio of length to diameter in the case of bar magnets a chromium steel originally 22 cm. in length and 0.6 cm. in diameter was gradually shortened to a length of 2.4 cm.; this shortening raised the temperature coefficient from 2.4 per cent. up to 4.2 per cent. The ratio of length to diameter (l/d) was also found not to be without influence on the magnetometer determination of the coercive force. When the value of l/d fell below 10, these determinations gave too low values; practically this point is not important.

The Matthews Engineering Co., Sandusky, Ohio, has added to its line of automatic lighting plants a new size of 300-watt rating, 32-volt type.

BLAIR REMOVABLE SLAG POCKET

Enables a Schedule of Repairs Designed to Make Open-Hearth Operation Continuous

The Blair Engineering Co., Chicago and New York, whose reversing valve system was described in THE IRON AGE of Feb. 24, 1916, and whose port construction as used in open-hearth furnaces is well known, supplies the following description of the Blair removable slag pocket, the pocket being a separate structure from the main furnace structure, and which may be removed and replaced by a spare. This obviates the necessity of shutting down for cleaning out pockets, work which is not only destructive of the brickwork of the pockets, and expensive in that respect, but also costly because of the interruption in production. The losses are particularly severe in the operation of basic furnaces.

Attempts have heretofore been made to remedy the difficulties referred to by providing receptacles to be placed within the permanent walls of the furnace structure, in position to receive the slag, and when filled to be replaced by empty ones. Such efforts, however, have been found impractical because the slag adheres to the walls of the structure and the receptacles cannot be removed without seriously damaging or destroying the walls while, in addition, the temperature in the slag pockets is too high to permit men to work in them.

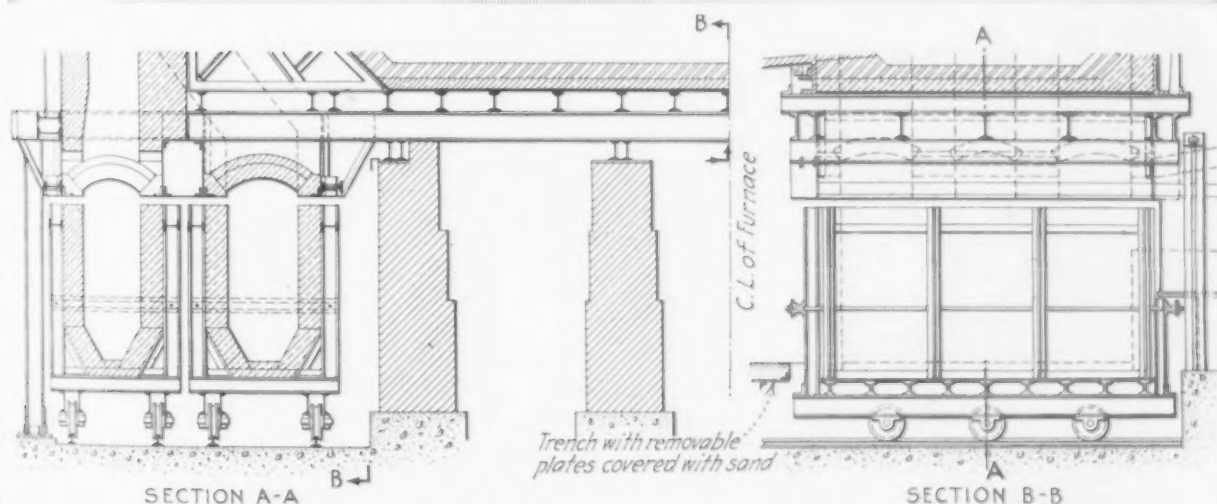
In the accompanying drawing is shown the construction of a furnace having the Blair removable slag pockets. The slag-pocket is a complete structure, separate from the remainder of the furnace, which is independently supported. It consists, in its preferred form, of a wheeled carriage for convenient moving on a track at each end of the furnace. The carriage has metal posts, suitably braced, rising at intervals from the carriage bed to provide a framework for the brick

pockets the bricks are knocked in to destroy the temporary bond, but without disturbing any other part of the furnace structure. Then the slag-pocket carriage may be withdrawn and replaced by another, and the spaces again bricked up.

Instead of using brick after the slag pockets are in place the joint in the walls may be made by placing a layer of ganister on top of the slag pocket walls and thereafter shoving the whole pocket or box up tight against the upper portions of the walls by four screws at the corners of the carriage. In this case, where the amount of the lift is small, say an inch or two, the screws are simpler and better than a hydraulic ram for the purpose. This would make the operation similar to putting the bottom on a Bessemer converter.

Instead of requiring from a week to 10 days for the removal of the slag and rebuilding the slag pockets and down-takes as heretofore, with the attendant loss of product and that due to the considerable amount of labor and fuel to bring the furnace back to melting temperature, the whole operation of removing the slag and replacing the pocket equipment may be accomplished in a few hours, thus enabling a large portion of the heat of the furnace to be retained and operations quickly resumed. The pockets may be renewed without any more loss of time, fuel or labor than attends the operation of burning out the flues periodically and the two should go together.

The Blair Engineering Co. maintains that a properly designed and equipped open-hearth furnace can be operated practically as continuously as a blast furnace. With such a furnace it is presupposed that it is equipped with ports which are practically permanent and prevent the destruction of the ends of the furnace; valves which eliminate delay from that source, and slag pockets which make shutdowns for general repairs unnecessary. The following schedule of repairs and operations is suggested by the company:



Typical Installation of Blair Slag Pocket, Which Is a Separate Structure from the Main Furnace Structure. A wheeled carriage moving on a track supports the brick walls of the pockets, thus providing a ready means for their removal

walls forming the slag pockets. The lower ends of the port down-takes are provided with metal binding for supporting the slag pocket arches at the lower ends of the down-takes, whereby these arches are separated from the slag pocket walls and are not dependent on them for support. The dimensions of the structure adapt it to fit under the down-takes of the flues, registering its pockets therewith in proper alignment to receive the slag.

On placing a slag pocket carriage in position there is left a narrow opening between the upper ends of the pocket walls and the down-take walls, and a similar opening between the wall of the flue leading to the regenerative chambers and the adjacent wall of the pocket structure. These spaces are temporarily closed by bricking them up to form tight joints connecting the slag pocket with the port down-takes and with the regenerative chambers.

When it becomes desirable to remove the slag-filled

1. Front and back walls. Replaced without material delay.
2. Roof. Requires six hours. Done while burning out flues over Sunday. Make no other major repairs.
3. Ports. Require no other repairs than shaping up the blocks with chrome ore.
4. Slag pockets. Changed in two to three hours while burning out flues over Sunday. Only such pocket to be changed as may be filled up. Make no other major repairs.
5. Checkers. Normally the air chambers clog up sooner than the gas. When shutting down for the burn-out, remove the air slag pockets, and knock out bulkheads in both ends of air chambers, providing ample fresh air.

The checkers can then be replaced in 30 hr., losing less than one day beyond the Sunday shutdown. Make no other repairs, but treat the gas chambers in the same way another week-end.

In reaching these results the company emphasizes the use of Blair ports, valves and slag pockets.

THE BELGIAN STEEL INDUSTRY

Cockerill Works a Typical Example of Existing Conditions—Signs of Life Appear

A recent article on the reconstruction of Belgian industries appearing in the *Engineer*, London, describes the present condition of Belgian steel plants. Referring to the Cockerill Works, the correspondent states that, of the many departments, not one remains intact to-day.

The position in the steel works is that of the seven blast furnaces; five are practically destroyed, but it is hoped that two can be put in operation, one perhaps within a few weeks, and another in the course of a few months, if the necessary material for the repair work can be obtained as well as the ore and coke for working. The company possesses the refractory material for the blast furnaces. The fuel question is, how-

which the necessary refractory materials have been ordered in England.

Of the 12 rolling mills all but two are destroyed, and as those which remain are the plate and tire mills, these will be the initial products of the company when work is resumed on the restricted scale indicated. It will not, however, be possible to make a commencement in the Bessemer converter shop for a long time to come, and the famous rail mill, the first to be built on the Continent with a direct reversing engine, and which has made an enormous output, is not likely to be rebuilt for another 18 months, the intention being to provide the materials of construction in the shops of the company.

The bridge and boiler-making plant was housed in six large workshops served by between 30 and 40 overhead cranes. The whole of this important department is in ruins. Cranes have been removed, as well as the whole of the equipment and large stocks of material.

In the forging department many heavy presses were installed, including two vertical 2000-ton presses, seven hammers and a line of re-heating furnaces. The work of destruction has been carried out here with particular completeness, and although only one of the 2000-ton presses has been removed, the accumulator has been destroyed, so that that which remains cannot be employed. The foundries for the molding of iron and steel, and the special foundry for bronze molding, as well as the tire and axle department, where the Arbelle stamping process was employed, have been put entirely out of commission.

The enemy enlisted the assistance of metallurgical professors and German steel makers to instruct the purely military element as to the precise means by which an undertaking which was so powerful a rival of the German steel



Coke Oven Plant. (In circle) A view of the steel works

ever, very important, as no good coking coal is easily available to-day.

With regard to the melting plant, four of the five Bessemer converters are gone, and the other is damaged, and it will be necessary in the first instance to attempt to make a start with the open-hearth plant, two units of which can, it is hoped, be put into working condition within a comparatively short period, and for

trade could be most effectively destroyed. Apparently the work has been carried out with more diabolical thoroughness here than elsewhere, although perhaps there is not much to choose between this and other large works. Care was certainly taken at Seraing in putting the blast furnaces out of commission to strike at the very heart of this productive machine, and in practically every instance where a particular shop was not

absolutely devastated, a key section of it was removed or destroyed.

The illustrations portray very vividly the scene of desolation by which the visitor is confronted in every department. It is not merely that the important items of the equipment have been removed, but that where removal was either impossible because of difficulties of transport or lack of time, wanton destruction was resorted to, valuable machinery being broken up and large tools being dragged from their beds by locomotive power exercised through chain attachments.

The view in the steel works shows what has been aptly termed the cemetery, as in it was deposited a mass of wreckage which the enemy was unable to remove, and which remains as evidence of the manner in which the destruction of these works was accomplished. Although a considerable quantity of ordinary scrap was available, the enemy evidently preferred to leave much of it behind, and to break up machine tools and other plant in order to provide scrap steel for his own industries. It is estimated that some 12,000 tons of scrap, a great deal of which was obtained in this way, has been sent into Germany, material being for a considerable period removed at the rate of 300 tons per day.

A particularly flagrant case of theft was that of the large 10,000 hp. gas engine which was only completed in 1914, and which is the outcome of many years' experience. Not content with the removal of this machine, the enemy persistently searched the works until they discovered the working drawings, which were also taken away.

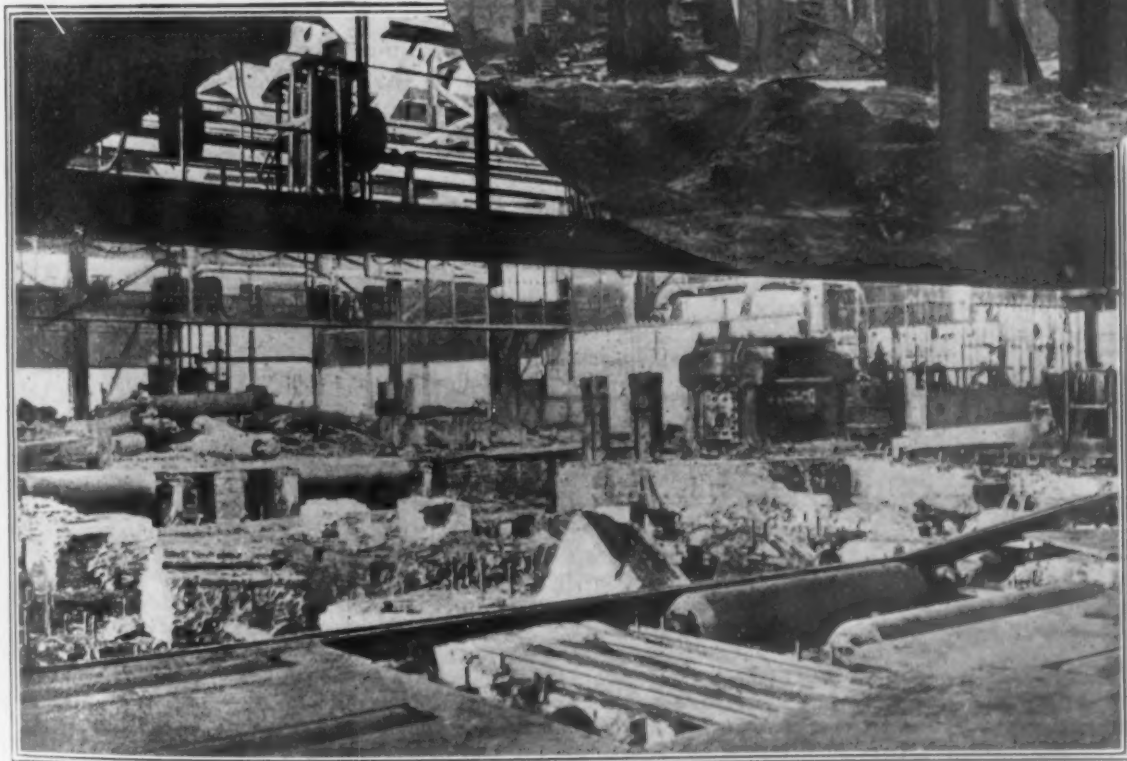
Belgian Plant Destruction Noted by American Engineer

Jerome R. George, chief engineer
Morgan Construction Co., Worcester,

plants of Belgium. The oldest, most famous, but not now the largest—the John Cockerill Works at Seraing, founded in the early eighties, had large collieries, blast furnaces, steel mills and foundries, locomotive shops, gun shops, steam engine works and ship yards. Not a wheel is turning at this great plant. The Germans took away or wrecked the blast furnaces, took away the rolling mills, wrecked the Bessemer converters, and besides taking away 1600 machine tools, burned the pattern shop and storage the evening before the armistice was signed. I was all through the plant.

"The other and larger works is at Ougrée, and I went through that plant today. The director, who showed me about, had refused to operate for the Germans the Morgan rod mill; he had been tried, found guilty of treason and sentenced to fifteen years at hard labor in a penitentiary. He had, therefore, been in a German prison with murderers and thieves for 2½ years—and he, too, looked it.

"The Germans took away 95,000 tons of machinery and over 20,000 sq. m. of buildings, and they took away these things in a way to make it most difficult to resume opera-



Live Train of Rolling Mill. (In circle) The Bessemer Converters

Mass., is making an extended stay in France, Belgium and the United Kingdom, studying conditions as they affect the steel industry, and particularly, of course, as they affect the future business of his own company, which manufactures rolling mill equipment. In a letter written from Liège, Feb. 8, he says of conditions in Belgium:

"Here in the suburbs of Liège are located the principal steel

tions. And please take note of this—what they could not take away they damaged just as you have read.

"I have seen it with my eyes and can tell you that the Germans had a well-defined plan to cripple the Belgium industries, thinking, poor fools, that these people would perhaps have to go to Germany for their supplies of iron and steel. They were still at their robbery game when the armistice was signed, and I saw many carloads ready for shipment lying on the shipping platforms."

A Pyrometer for Brass and Bronze

An alloy has been developed by the Hoskins Mfg. Co., Detroit, from which, it is stated, a satisfactory protection tube can be made which allows the use of Hos-



Measuring the Temperature of Molten Brass or Bronze

kins pyrometers in measuring the temperature of molten brass and bronze.

The tube consists of three parts, as shown. Section B telescopes into the upper end of the seamless steel tube D, and the protection tube C is held in the lower end. This tube, 10 in. long, is made of the new alloy and is the part inserted into the metal. The thermo-couple A is entirely encased in the tube and can be renewed.

The alloy tip and the thermocouple are the only parts which require renewal. When the molten metal ultimately destroys the alloy tube, it can be removed and a new one installed. A shoulder is cast on the upper end of the tip and this engages in the collar shown on the tube D, being held in its place by giving it a half-turn, and then packing the connection with a special refractory cement.

If the tube is used to complete destruction or to a point where the molten metal can reach the thermo-couple, of course the latter has to be repaired. This can be done by cutting off the damaged part, and then twisting and rewelding the wires. This procedure can be repeated until the couple reaches a length of $3\frac{1}{2}$ ft. when it must be renewed. The couple can be changed end for end; that is, the unwelded end can be welded

serial numbers, and with a statement of the actual errors found in each block. While for toolroom work a degree of accuracy represented by the millionth of an inch is not necessary, they are prepared to offer sets with such a limit when required.

The blocks are approximately 1 in. square, with a $\frac{1}{4}$ in. countersunk hole through the center. This design obviates the necessity of cumbersome outside clamps where stacks of blocks are assembled with special attachments at the ends, as these can be held in place by a $\frac{1}{4}$ in. rod and countersunk screws. For very thin blocks, which are difficult to handle without troublesome warping due to temperature changes, smaller squares will be used.

The first sets ready for the market will consist of five blocks, 1 in., 0.5 in., 0.3 in., 0.2 in., 0.1 in., giving any tenth up to 2 in. The addition of $\frac{1}{8}$ in., $\frac{1}{4}$ in. and $\frac{3}{8}$ in. sizes will provide any eighth or any tenth up to $2\frac{1}{2}$ in. in a set of eight blocks. The further addition of $\frac{1}{16}$ in. and 0.05 in. blocks, making ten in all, will give any sixteenth or any 0.05 in. interval.

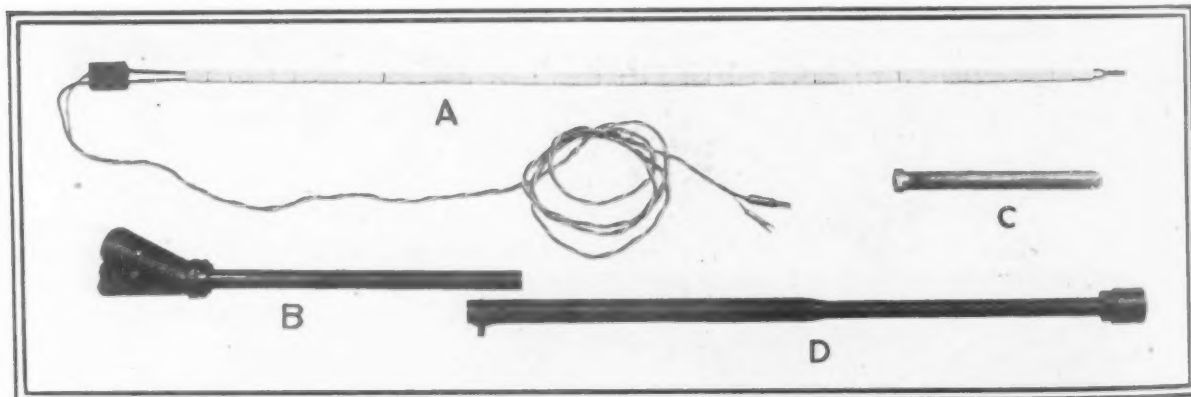
The company is also offering toolmakers' flats or small surface plates, of hardened tool steel, 5 in. in diameter, with two accurately lapped surfaces onto which gage blocks can be wrung.

New Type Wash Bowls for Shops

A new type of apparatus providing for a considerable number of persons washing at the same time has been put upon the market by the Manufacturing Equipment & Engineering Co., Boston. The bowls now offered have not only a common water supply and a common waste, as in the earlier types, but also a common vent. Every bowl is trapped and vented.

The bowls are furnished in double or single batteries; with hot and cold, or one temperature of water; with plain cast-iron, galvanized iron, or vitrified porcelain enameled bowls; and with faucets, or mixers, as desired.

A paper entitled "The DeLamater Iron Works—The Cradle of the Modern Navy," which was read before a



The Protective Tube C, Made of a New Alloy, Permits the Use of the Pyrometer for Measuring the Temperature of Molten Brass and Bronze

and used as the hot end. It is not necessary to recalibrate the couple after rewelding it.

Hoke Precision Gages Now Available

The Pratt & Whitney Co., Hartford, Conn., announces it has secured the manufacturing rights for the Hoke precision gages, which are now being made at the Bureau of Standards as inspection and reference sets for army and navy use.

The blocks were produced at the Bureau of Standards by W. E. Hoke, of St. Louis, first as an employee of the bureau, and later as a major of ordnance. The bureau is now producing Hoke blocks within limits of three millionths of an inch, and the greater part of these show no error of a millionth. The measurements are made by optical methods.

The Pratt & Whitney Co. will furnish with each set of gage blocks a signed certificate from the Bureau of Standards, identifying the particular gage blocks by

meeting in Philadelphia on Nov. 14, 1918, of the American Society of Naval Architects and Marine Engineers has been published as a souvenir book. Its author is H. F. J. Porter, consulting engineer, New York, who spent four years after leaving college in 1878 with the DeLamater Iron Works, which is perhaps best known as the seat of the activities of Capt. John Ericsson and the building of the Monitor and the development generally of much now recognized as essentials in naval construction. The souvenir volume form of the paper was a feature of a recent annual dinner of the veterans of the DeLamater works, and it is now proposed to erect a bronze memorial tablet on the front of the Cunard pier, New York, which occupies the site of the works.

The Union Switch & Signal Co., Swissvale, Pa., has purchased machinery for finishing crank shafts and cam shafts, and will be ready to make deliveries about the first of June. It manufactures its own forgings.

American Electrochemical Society

Electric Furnaces in the Foundry—New Use of Silicon and Titanium—Released War Information —Motion Pictures of Heat-Treating Furnaces

ELECTRIC furnace possibilities and products were a prominent topic at the last session on Friday afternoon, April 5, of the thirty-fifth general meeting of the American Electrochemical Society at the Chemists' Club, New York. The meeting, held on April 3, 4 and 5, was one of the largest ever gathered in New York, the registration being over 325. There were two features of the sessions: A symposium on released information, having to do with work of electrochemists during the war, and a paper on a new application of the electric steel furnace to the cast-iron industry, which attracted unusual interest. These two matters were presented at the Friday sessions, those on Wednesday and Thursday having been devoted to general electrochemical problems and to business matters.

Duplexing with the Cupola

This is not the first meeting of this organization at which some new phase of the electric steel furnace industry has been presented. Several times in the past important papers on this subject have been read. The meeting this year was characterized by the bringing up of the possibilities of the electric furnace in the iron foundry or really its use in conjunction with the cupola. The paper which introduced this new subject was entitled "Improving the Quality of Gray-Iron Castings by the Electric Furnace," and was presented by the author, George K. Elliott, chief chemist and metallurgist, Lunkenheimer Co., Cincinnati. It is published substantially in full on other pages of this issue.

Dr. Richard Moldenke, in discussing the paper, rather enthusiastically testified his approval of most of the points made by the author. He said that the paper threw a new light on several problems that had bothered iron foundrymen for many years. The sulphur problem was one. All iron castings ultimately become scrap and are being used over and over until now the sulphur in this scrap has mounted to as high as 0.12 per cent in many cases. This has resulted in changes in specifications, particularly during the war, when poor coke, containing as high as 2.40 per cent sulphur, had to be used. The paper indicates a solution of this problem in that the duplexing process with the cupola reduces the sulphur in the iron from one-fourth to one-third of the original content.

Dr. Moldenke spoke of the advantages of high sulphur, one in particular being that it makes the iron wear better and bestows chilling properties on the iron, but low sulphur is desirable as a general proposition. High sulphur is beneficial to brake shoes, for instance.

Some Disadvantages

As to the duplex process as applied to the iron foundry, Dr. Moldenke rather disapproved of this. He said that the average foundryman does not like to have two processes to handle. The cost question he believed to be also serious. If the cost of electrically melted iron should exceed that of cupola iron by no more than $\frac{1}{2}$ ¢. per pound, such a furnace and process ought to go into the foundry.

It is possible in the use of the electric furnace as suggested to regulate the carbon easily, said Dr. Moldenke. It will then be possible to make a separate class of high-grade iron castings and to obtain almost any iron one might set out to produce. "I have fought the question of semi-steel all my life and cannot see why adding from 3 to 4 up to 50 per cent steel to iron warrants charging a few cents more per pound for the resulting iron." In the electric furnace it will be pos-

sible to make so-called semi-steel or rather a high-grade cast iron using steel in the charge.

It is possible, continued Dr. Moldenke, to obtain as hot an iron in a cupola as in the air, reverberatory or open-hearth furnace if the cupola is run properly. To this Mr. Elliott disagreed and in concluding the discussion he said that he believed some of the excellent results obtained in his work were due to deoxidation in the electric furnace. Entirely reduced iron undoubtedly possesses virtues not possessed by ordinary pig iron.

Released War Information

Many interesting subjects were dealt with under the general topic of "Released Information," some of them not of technical interest to the steel industry. The Baily furnaces were brought prominently before the meeting, first by paper, "Electric Furnaces of the Resistance Type Used in the Production of Essential War Materials," presented by the author, T. F. Baily, president Electric Furnace Co., Alliance, Ohio, and then by a series of motion pictures of certain installations of these furnaces.

Mr. Baily's paper presented a detailed description of a 900-kw. heat-treating equipment intended for automatically and continuously hardening and tempering cast-steel anchor chains of the heaviest type at the Cleveland plant of the National Malleable Castings Co. The heating is accomplished by an electrical resistor of granular carbon confined in carborundum fire-sand walls and the machinery is controlled by pyrometers which allow of hardening and tempering at the exact temperatures to which the machine is set.

Moving Pictures of Baily Furnaces

Exceedingly excellent and interesting motion pictures of the installation described by the paper were shown as well as one for the same process for heat-treating draw-bar knuckles at the Sharon, Pa., plant of the same company. A smaller electrically controlled heat-treating furnace was shown in operation by a motion picture which is in use at the plant of the Erie Specialty Co., Erie, Pa., where precision screws, bolts, etc., for airplanes, are heat-treated automatically in closed boxes, it being necessary that the finished product be uncontaminated by scale or tarnish while being treated. A motion picture was also presented of the Baily furnace for melting brass and bearing metals at the plant of the Lumen Bearing Co., Buffalo.

The cost and properties of electric steel as compared with converter and the small open-hearth were discussed in a paper on the introduction of the electric furnace into the foundry by W. E. Moore, president W. E. Moore & Co., engineers., Pittsburgh, and inventor of the Moore electric furnace. The paper was read by the author and will be presented in abstract in a later issue of THE IRON AGE. The author concludes that electric steel is superior to the product of the small open-hearth or the converter in regard to cheapness of raw materials, conservation of alloying metals, waste of lining, temperature obtainable, control of chemical composition and quality of steel produced. He prefers the acid-lined electric furnace because it turns out somewhat better steel and castings.

J. A. Coyle, Universal Rolling Mill Co., Bridgeville, Pa., in a written discussion read by Dr. J. W. Richards, disputed the author's statement that electric steel is a competitor with open-hearth; and among other claims said that the lining cost of electric was much in excess of the small open-hearth. He cited among some dis-

advantages of the electric furnace the difficulty in charging it, the removal of slags and the surging of the current. Mr. Moore, in reply, stood by his assertion that the electric furnace for acid steel is cheaper than the small open-hearth furnace.

Electric Silico-Manganese

A paper by B. S. Klugh, Southern Manganese Corporation, Anniston, Ala., entitled "Electric Furnace Manufacture of Silico-Manganese," was not preprinted but was presented in abstract from the manuscript by Dr. Richards. The author discussed the results of making various silicon-manganese alloys from varying ores in two rectilinear open-top electric furnaces. In some cases high-grade manganese ores and silica rock were used and the yield, composition and other details of the practice were given.

An interesting statement was the experience in using blast-furnace slag from which a product containing about 17 per cent manganese and 20 per cent silicon with carbon under 1 per cent was made. About 9000 lb. of slag per ton of product was produced and 96 per cent of the manganese in the slag was recovered. Another alloy produced was one of 20 per cent manganese, 50 per cent silicon and 30 per cent iron.

E. F. Northrup, in a paper "Principles of Inductive Heating with High Frequency Currents," presented in great detail results of experiments in developing a small furnace for electrically melting steel and alloys of all kinds. It is understood that the project has not developed into anything on a large scale, but that it is an important achievement.

New Use for Silicon and Titanium

A most interesting new use for silicon and titanium was developed during the war and some of the results were presented at the Friday sessions. Compounds of these metals formed the basis of the efficient smoke screens used in combating the submarine tactics of the enemy. This subject was presented by two papers, one "Silicon Tetrachloride," by O. Hutchins, and another, "The Role Played by Silicon and Titanium Tetrachlorides During the Past War," by G. A. Richter. These compounds, when sprayed into moist air, break up into silica and hydrochloric acid, which in the presence of ammonia, sprayed in conjunction, forms a beautiful and very dense white smoke of particularly efficient screening power.

The remarkable work of electrochemists in developing poison gases and in building a complete new arsenal, known as the Edgewood Arsenal, for making these, was vividly recounted by Col. W. H. Walker of the Chemical Warfare Service, and professor of chemistry, Massachusetts Institute of Technology, Boston.

Steam Power Cost in Pittsburgh

A discussion of the cost of steam power in the Pittsburgh district, particularly when generated in large stations, and when off-peak power is used for electrochemical and electrometallurgical purposes was contained in a paper, "Power Production for Electrochemical Purposes," by C. S. Cox, general manager, Duquesne Light Co., Pittsburgh. The author concludes that this kind of steam power can compete with water power in all except the most favorable cases for developing by hydraulic power.

"Lead Plating of Shell Interiors and Boosters" was a paper by A. G. Reeve, which gave a description of the apparatus and process utilized with practical application of well-known lead electroplating formulae in solving two problems in the manufacture of certain lachrymatory gas shells.

"A Process for Electrolytically Refining Nickel" was the title of a paper by G. A. Guess, professor of metallurgy, Toronto University, Toronto, Canada, which presents a new method for obtaining this metal.

Government Control of Hydroelectric Power

A decided difference of opinion was found to exist over the question of Government development and ownership of future hydroelectric projects. A committee of the society made a majority report favoring

private initiation and organization, but a minority report, headed by Dr. Carl Hering, favored the Government ownership of such interests. The minority report was rejected by a large majority vote of the society.

Two honorary members were chosen by the society, Dr. Edgar F. Smith, provost University of Pennsylvania, and Dr. Charles F. Chandler, professor of chemistry, Columbia University.

New Officers

The new president of the society for the ensuing year is Lieut.-Col. W. D. Bancroft, Chemical Warfare Section, U. S. A., and professor of chemistry, Cornell University. The new vice-presidents elected were D. U. N. Dorr, W. R. Whitney and Dr. Carl Hering, with H. C. Parmelee, E. Blough and R. E. Zimmerman elected as managers. B. G. Salow was re-elected treasurer and Dr. Joseph W. Richards was again chosen as secretary.

SUBSIDIES WITHDRAWN

No More Payments on Cold-Blast Pig Iron by British Government

WASHINGTON, April 8.—Consul General Robert P. Skinner at London has cabled that the Ministry of Munitions there has withdrawn certain existing subsidies payable on cold-blast pig iron. This withdrawal has been made in consequence of an arrangement with the manufacturers. The Ministry of Munitions has authorized an advance of 11s. per ton on the maximum price effective from April 1. This advance, added to the increase of 15s. effective Jan. 1, will raise the maximum price for home sales to £10 8s. 6d. per ton f. o. b. maker's works. The export price remains unchanged at £11 12s. 6d., but the export drawback will be reduced by amount of increase in home price.

The Bureau of Foreign and Domestic Commerce has also made public a report from Madrid concerning a new law proposed by the Spanish Government for export duties on ores and metals. Based on an exchange rate of \$0.193 pesetas, the proposed duty per ton of 2204.6 lb. follows:

Pyrates, \$0.338; other iron ores, \$0.29; ores containing more than 2½ per cent of copper, \$0.97; ores containing not more than 2½ per cent of copper, \$0.38; manganese, \$3.22; other ores not specified, dutiable upon the contents of wolfram and oxide of tin, \$14.47; zinc plate and pig zinc, \$3.46; pig lead, \$8.68; silver-bearing pig lead, \$9.65; lead pipe, \$8.68; ingots, \$6.75; copper shells, \$6.75; black copper and copper scrap, \$17.37; bars, \$17.37; plates and nails, \$17.37; sheet brass, \$17.37; tin, \$57.90.

The War Trade Board has announced the issuance of a general import license to be known as PBF No. 36, effective April 7, 1919, covering the importation into the United States from Mexico, Cuba, Haiti, Santo Domingo, and all countries of Central and South America, except British and French possessions, of all commodities, with certain exceptions, among which are the following: Pig tin, tin ore, tin concentrates, all metal alloys containing tin, and tungsten ore.

The embargo on tin is still being maintained under the general agreement among the associated governments. Licenses for importations of tungsten ore, it is announced, will be issued freely if the applications are otherwise in order. The British and French possessions in Central and South America are not covered by this general license, being already covered by general import license PBF No. 34. A special provision is announced, however, by the War Trade Board that the new general license is not to be construed as authorizing firms in the United States to trade with firms on the enemy trading list.

A new trading list superseding previous issues has been made public by the War Trade Board for Mexico, Cuba, Haiti, San Domingo, and the countries of Central and South America. Many firms have been removed from the old list. Copies of the new list may be obtained by direct application to the War Trade Board.

ADJUSTING CLAIMS

Contractors Must File Documents Before May 15 to Receive Attention

WASHINGTON, April 8.—War contractors having unadjusted claims against the War Department must file them by May 15 to take advantage of the present machinery of the department, according to an announcement made by Benedict H. Crowell, assistant secretary of war and director of munitions. The announcement was made in a letter to Secretary Glass of the Treasury Department.

For the delay in the contract adjustments has caused trouble in the Treasury Department as well as the War Department. The latter puts all the blame on the contractors who have been dilatory in the filing of their claims.

The Treasury Department's difficulties arise out of the fact that the contractors whose claims are still unadjusted are also holding back their income tax schedules and payments, while the banks which are holding their paper are complaining of the difficulty in liquidating these assets. The situation is also complicated by the approach of the Victory Loan campaign, for both the contractors and the banks find an excuse in these delays for the smallness of their prospective subscriptions.

As a result, the Treasury Department made a direct appeal to the War Department to expedite the settlement of these claims, as well as a formal request for information concerning the compensation which the contractors could expect and the date of probable settlements. In his reply, Mr. Crowell laid particular stress on the delays of the contractors themselves and insisted that his department is doing all it can to expedite the filing and the settlement of claims.

That there might be no further question about the machinery by which these adjustments are to be made, Mr. Crowell also sent to the Treasury Department a statement of the procedure to be followed, and at the same time made public his letter.

The process and basis of effecting settlements, as outlined in Mr. Crowell's letter:

"Forms for stating claims on informal agreements can be secured from any contracting officer, supply officer, claims board or negotiating body of any bureau at any part of the United States, and these officers, boards or bodies will give the contractors information and instruction concerning the manner of filling out these claims."

Mr. Crowell also added the following directory of the boards and officials with whom the various settlements are to be made:

War Department Claims Board, Washington, Munitions Building.
Board of Contract Adjustment, Munitions Building, Washington.
Ordnance Claims Board, War Department, Washington.
Claims Board, Air Service, War Department, Washington.
Claims Board, Chemical Warfare Service, War Department, Washington.
Claims Board, Construction Division, War Department, Washington.
Claims Board, Signal Corps, War Department, Washington.
Claims Board, Office Chief of Engineers, War Department, Washington.
Claims Board, Director of Purchase, War Department, Washington.
Board of Review for Medical and Hospital Supplies Division, War Department, Washington.
Board of Review for Machinery and Engineering Materials Division, War Department, Washington.
Board of Review for Motors and Vehicles Division, War Department, Washington.

DISTRICT AND ZONE BOARDS
Ordnance District Claims Boards

Baltimore, Md. . . . 945 Main Street, Bridgeport, Conn.
Bridgeport, Conn. . . . 19 Portland Street, Boston.
Boston . . . 155 E. Superior Street, Chicago.
Chicago . . . 229 E. Sixth Street, Cincinnati.
Cincinnati . . . Plymouth Building, Cleveland.
Cleveland . . . 35 Washington Boulevard, Detroit.
Detroit . . . 1107 Broadway, New York.
New York . . . 1710 Market Street, Philadelphia.
Philadelphia . . . Chamber of Commerce Building, Pittsburgh.
Pittsburgh . . . 82 St. Paul Street, Rochester, N. Y.
Rochester, N. Y. . . . Equitable Building, St. Louis.

Chemical Warfare Service

Board of Review, Gas Defense, New York.
Board of Review, Gas Defense, Edgewood Arsenal.
Board of Review, Gas Development, Cleveland.

Zone Boards of
Contract Review

Zone No. 1—Boston, 108 Massachusetts Avenue.
Zone No. 2—New York, 461 Eighth Avenue.
Zone No. 3—Philadelphia, Twenty-first and Oregon Avenue.
Zone No. 4—Baltimore, Md., Coca-Cola Building.
Zone No. 5—Atlanta, Ga., Transportation Building.
Zone No. 6—Jeffersonville, Ind., Meigs Avenue.
Zone No. 7—Chicago, 1819 West Thirty-ninth Street.
Zone No. 8—St. Louis, Second and Arsenal Streets.
Zone No. 9—New Orleans, Audubon Building.
Zone No. 10—San Antonio, Texas, General Supply Depot.
Zone No. 11—Omaha, Neb., Army Building.
Zone No. 12—El Paso, Texas.
Zone No. 13—San Francisco, Fort Mason.
Zone No. 14—Washington, Seventeenth and F streets, N. W.

Office of the Director of Purchase and
Storage

The District Offices of Air Service Finance

Lt. L. S. Landers, district finance manager, Boston, Little Building, Boylston and Tremont streets.
Capt. A. B. Berger, Dist. finance manager, New York, N. Y., 360 Madison Avenue, Abercombie and Fitch Building, ninth floor.
J. E. Cole, district finance manager, Buffalo, P. O. Box 56.
Capt. Fred White, district finance manager, Detroit, 1550 Woodward Avenue.
C. S. Hamilton, district finance manager, Chicago, Room 1216 Consumers Building.
Lt. N. L. MacLeod, district finance manager, Pittsburgh, Seventh and Liberty Avenues, 11th floor, Kennan Building.
Capt. D. G. Ong, district finance manager, Dayton, Ohio, 810 Mutual Home Building.
C. C. Campbell, district finance manager, Portland, Ore., Yeon Building.

The Outlook for Canadian Trade with Great Britain

Although there is a lack of confidence among buyers of steel products that prevents much business from being done, Mark Workman, president of the Dominion Steel Corporation, stated on his return to Montreal, Que., from England, he was impressed with the possibilities of future Canadian trade relations with Great Britain, and that as soon as the uncertainty surrounding the peace conference is cleared up, there should be a notable activity in Anglo-Canadian trade. "The signing of the peace treaty," said Mr. Workman, "should set an end to the present dullness in trade circles and should go a long way toward stimulating business between Canada and England." In this connection Mr. Workman pointed out that the increasing demands of British labor, particularly in the coal mining industry, had resulted in a tremendous increase in the cost of mill operations, which for the time being had undoubtedly lost to Britain some of her advantage in the world markets. Consequently he was of the opinion that Canada was in a better position to reach out after export trade, which had become an absolute necessity if Canada were to take care of her war debt. He stated that the great necessity of the moment was shipping facilities, which had been recognized by the United States long ago, where constructive measures had already been adopted and consistently carried out, even to the point of providing Government assistance in granting low freight rates with the object of placing the American manufacturer in an independent position as regards water transportation, and to-day the American exporter has at his disposal a fleet of considerable size.

The steel industry in the Mahoning Valley, Ohio, suspended Thursday, April 3, when units of the Thirty-seventh Division, composed of boys from this section, were welcomed home. Only those departments requiring continuous operation, such as blast furnaces, were kept in commission. Major John A. Logan, whose family has been identified with the iron and steel industry in this section for many years, led the parade, which was the feature of the celebration.

The Page Steel & Wire Co., Union Arcade, Pittsburgh, is now operating its open hearth steel plant, rod and wire mills at Monessen, Pa., on a straight 8-hr. a day basis, in order to give work to the greatest possible number of men during the readjustment period, and also to cut out the extra pay for time over 8 hours.

The Louis Hall Co., machinery broker and engineer, is now located at 681 Market Street, San Francisco. It has taken over the Western representation of the United Iron Works Co., Kansas City, Mo., with seven plants in the Middle West and Southwest.

Republic Iron & Steel Will Probably Absorb DeForest Company

PITTSBURGH, April 8—(By Wire).—The Republic Iron & Steel Co. has secured an option on a controlling interest in the stock of the DeForest Sheet & Tinplate Co., whose plant is at Niles, Ohio.

The original works of the DeForest Sheet & Tinplate Co. were built in 1909, but afterward enlarged and the plant now contains 10 hot sheet mills with galvanizing pots having an annual capacity of about 6000 tons of black and galvanized sheets and also makes about 10,000 tons per year of terne plate for roofing and siding. The president of the company is C. S. Thomas, A. C. W. Martin is vice-president, and M. C. Summers secretary.

The Republic Iron & Steel Co. is not a producer of sheets, and in order to give it a more diversified product will likely take over this plant. Consent of the stockholders is now being obtained for the transfer to the Republic company at a certain price for each share of stock, and it is practically certain the stockholders will assent to the sale.

Chapter Activities of Engineers' Association

The next meeting of the New York chapter, American Association of Engineers, will be held on the evening of April 10, in Room 3, Fifth Floor, of the United Engineering Societies Building, 29 West Thirty-ninth Street, New York.

The Washington chapter of the American Association of Engineers elected the following officers March 25: President, Harry Stevens, civil engineer, Union Trust Co. Building; first vice-president, A. Y. Hess, designer, Navy department; second vice-president, Clegge Thomas, Washington Loan & Trust Co. Building; secretary, E. L. Howard, Bureau Yards & Docks, Navy department; treasurer, O. M. Sutherland, mechanical engineer, Bureau Yards & Docks.

The Kansas City Club of the American Association of Engineers elected the following officers March 21: Chairman, J. E. Jacoby, consulting engineer, Shukert Building; vice-chairman, W. B. Cast; secretary, R. N. Clarke; treasurer, S. M. Bate.

The Pittsburgh chapter of the American Association of Engineers has had a secretary since April 1, and is the first chapter outside of national headquarters at Chicago to have a secretary giving all of his time to the work of the association. F. E. N. Thatcher has been selected for the position and will have an office at 1312 Fulton Building, Pittsburgh.

Association of Tin Plate Manufacturers

The recently organized Association of Tin Plate Manufacturers has headquarters in room 909, Oliver Building, Pittsburgh. The association includes practically all the independent tin plate mills in the country, but the American Sheet & Tin Plate Co. is not a member, it not being the policy of any subsidiaries of the United States Steel Corporation to join an organization of any kind. The officers of the new association are E. T. Weir, Weirton Steel Co., Weirton, W. Va., president; E. R. Crawford, McKeesport Tin Plate Co., McKeesport, Pa., vice-president; E. T. Sproull, Trumbull Steel Co., Warren, Ohio, treasurer, and George D. McIlvain, secretary. The board of trustees consists of E. T. Weir, E. R. Crawford, Philip Schaeffer, Jones & Laughlin Steel Co.; John Duncan, Wheeling Steel & Iron Co., and E. T. Sproull.

Course in Management

A course of 30 lessons in employment management is announced by Washington University at St. Louis. The details of the course were arranged by the Federal Board for Vocational Education, the St. Louis Chamber of Commerce and the Employers' Association of St. Louis.

Major William C. Rodgers, formerly of the Ordnance Department, now vice-president of the St. Louis Em-

ployers' Association, who was largely instrumental in promoting the course, said that of 2000 strikes that he had observed, fully two-thirds could have been avoided by tactful management on the part of the employers.

The following subjects will be studied in the new department of the university, which is under the supervision of Dean W. F. Gephart of the School of Commerce and Industry: Selection of men for particular work, requirements of different occupations, training of employees, fixing of just wages, maintenance of proper working conditions, protection of employees against accidents, fatigue and disease, living conditions of workers, relations between employers and employees.

Trumbull Steel Co.'s Expansion Plans

YOUNGSTOWN, OHIO, April 7—Directors of the Trumbull Steel Co., at Warren, Ohio, have recommended that the capital stock of the company be increased from \$20,000,000 to \$24,000,000, the increase to consist of \$4,000,000 of preferred stock, or 40,000 shares. Trumbull now has \$14,000,000 common and \$6,000,000 preferred authorized.

In his letter to stockholders President Jonathan Warner states proceeds will be used in part to construct a mill for producing highly finished sheets to cost approximately \$1,500,000. "Your directors urgently advise this because from our strip department we are now supplying manufacturers of automobiles with part of their requirements," states Mr. Warner's letter, "and we would have quite an advantage could we also sell them the highly finished sheets which they purchase in large quantities. Your board of directors feel that the position of your company in the trade would thus be greatly strengthened."

"In the opinion of your board, it is important that the productive capacity of the steel plant be utilized to the utmost," says Mr. Warner. "Through acquisition of the Liberty Steel Co. it is necessary for Trumbull to issue preferred stock to the amount of \$1,300,000, or at the rate of \$130 per share for the common stock of Liberty. Trumbull has obtained an option for the purchase of a controlling interest of common stock of Liberty, payment to be made in Trumbull preferred."

He also states that the directors have contracted for the purchase of "certain interests in iron ore mines located on the Mesaba range, and will own them in conjunction with a large company which has been producing iron ore for many years. This purchase was made in anticipation of the eventual construction of blast furnaces by your company. The iron ore purchase will necessitate the payment of quite a large sum of money during the year 1919."

The president also informs stockholders that the Trumbull Steel Co. has purchased an interest in the Consolidated Steel Corporation. It has already paid for part of its holdings in this company and is obligated for more, he writes.

The increased line of manufacture, as well as the increased business of the Oliver Machinery Co., Grand Rapids, Mich., has made it necessary to enlarge its Chicago office, and it has moved into new quarters at 810 Railway Exchange Building. G. C. Conklin, who has for many years been connected with the factory at Grand Rapids, is the new district manager, in charge of the Chicago office, and Geo. C. Ramer, who had formerly been connected with the St. Louis office of the company, will be an addition to the sales engineering force in connection with the new Chicago office. The company manufactures pattern-shop equipment, wood-working machinery, engine lathes and equipment for industrial and vocational schools.

To market and distribute products of the Youngstown Sheet & Tube Co., Youngstown, Ohio, in districts where the company has no sales offices, the Youngstown Steel Products Co., capitalized at \$5,000, has been organized. Officers are William E. Manning, Walter E. Watson, Leroy Manchester, William J. Morris and Walter Meub, all connected in an official capacity with the company.

German War Pig-Iron Output

The pig-iron output of Germany during the war, recently made public, was published in THE IRON AGE, Feb. 27, 1919, but only the totals and not the various grades were then obtainable. Since then the output as to grades has been issued. It is reproduced as in the accompanying table.

Owing to the shortage of manganese ores, says a writer in *Stahl und Eisen*, spiegeleisen was in great demand during the war because, owing to the blockade,

German Output of Various Grades of Pig Iron in Metric Tons

	1913	1914	1915	1916	1917	Jan. to Oct. 1918
Pig-iron	3,657,326	2,494,832	2,283,538	2,019,991	2,012,277	1,489,882
Bessemer	368,840	237,988	187,522	152,660	130,019	115,689
Open-hearth	12,193,336	9,289,989	7,246,322	8,515,086	8,307,571	6,763,592
Ferroalloys	2,599,887	1,996,786	1,793,865	2,380,308	2,446,092	2,255,312
Puddling	489,783	370,257	278,684	216,693	195,351	141,910
Other grades					50,937	31,109
Total	19,309,172	14,389,852	11,789,931	13,284,738	13,142,247	10,807,494

the importation of foreign manganese ores had ceased. Domestic ores even of low grade had to be pressed into service, the percentage of manganese in ferromanganese had to be lowered and the manufacture of ferro-silicon in blast furnaces had to be pushed. No ferro-silicon of high grade was produced at all in the country during the first half of the war period.

Charcoal Pig Iron Production

The production of charcoal pig iron in the first half of 1918, according to the statistics of the American Iron and Steel Institute, is almost exactly the same as that of the second half, that of the first half being 173,394 tons, and that of the second half being 172,830 tons. The number of furnaces in blast, Dec. 31, 1918, was 18, and the number out of blast 17.

The production for the year came from the following states:

Massachusetts	11,485 tons
Connecticut	
New York	2,087 tons
Pennsylvania	
Maryland	26,904 tons
Virginia	
Alabama	
Georgia	
Texas	2,122 tons
Tennessee	
Mississippi	
Michigan	246,009 tons
Wisconsin	58,617 tons
Missouri	

The production of cold and hot and warm blast charcoal pig iron, 1914-1918, was as follows:

Kind of Iron	1914	1915	1916	1917	1918
Cold blast	9,294	5,302	5,323	5,219	4,209
Hot and warm blast	254,630	290,850	367,088	371,306	343,015
Total	263,924	296,152	372,411	376,525	347,224

*Includes iron made with charcoal and electricity in 1914 and 1915.

*Includes small tonnage of pig iron made with charcoal and coke mixed.

Imports of Tungsten Bearing Ore

December imports of tungsten-bearing ore, by countries, were as follows:

Countries	Tons	Dollars
Mexico	4	6,440
Argentina	42	66,243
Bolivia	25	33,825
Chile	100	133,525
Colombia	35	42,700
Peru	45	53,447
China	244	258,720
Hongkong	526	571,451
Japan	12	18,218
Total	1,033	1,184,569

The December exports of tungsten and ferro-tungsten metal were limited to 2000 lb. to Canada, at a valuation of \$4,400 and 225 lb. to Argentina worth \$770.

The Gillespie Mfg. Corporation, engaged in tank and plate construction work, has moved to Paterson, N. J.

CANADIAN PRODUCTS

Marked Increase in Output of Electric Furnaces Last Year

The Mines Branch, Department of Mines, Ottawa, has issued a preliminary report of the production of minerals in Canada during the calendar year 1918.

The total shipments of iron ores from Canadian mines show a further falling off in 1918, being only

206,820 net tons, valued at \$863,186, or an average of \$4.17 per ton, compared with shipments in 1917 of 215,302 tons, valued at \$758,621, or an average of \$3.52 per ton. The 1918 shipments included 8153 tons from Quebec; 197,637 tons from mines in Ontario and about 900 tons mined in British Columbia. The ores comprised 170,907 tons of hematite and roasted hematite and siderite; 28,559 tons of magnetite; 6324 tons of ilmenite and titaniferous ore, and 900 tons (dry) of bog ore. The principal operations were as usual in Ontario at Helen and Magpie mines of the Algoma Steel Corporation, Ltd., all the ores mined being first roasted in the rotary kilns at Magpie before shipment.

Subject to a possible slight variation when final returns shall have been received the total production of pig iron in Canada in 1918 excluding the production of ferroalloys was 1,194,000 short tons, having a value of \$33,000,000, as compared with a total production in 1917 of 1,170,480 short tons, valued at \$25,025,960. Of the total production 1,163,520 short tons were made in blast furnaces and 30,425 tons were manufactured in electric furnaces from scrap steel, chiefly shell turnings. In 1917 the blast furnace production was 1,156,789 tons and the electric furnace production from scrap steel was 13,691 tons. Thus, although the total production of pig iron was greater than in any previous year the blast furnace production was less in 1918 than the output of 1916. The recovery of high grade low phosphorous pig iron in electric furnaces from steel turnings was in 1918 nearly two and a half times that in 1917, the first year these operations were undertaken.

The estimated production of steel ingots and direct steel castings in 1918, final returns for all operations not yet having been received, was 1,893,000 short tons, of which 1,820,000 tons were ingots and 73,000 tons direct steel castings. In 1917 the total production was 1,745,734 short tons, of which 1,691,291 tons were ingots and 54,443 tons were castings. The production of steel in electric furnaces in 1918 was about 120,000 tons, as against 50,476 tons in 1917, 19,639 tons in 1916, 5625 tons in 1915, and 61 tons in 1914. The total production of pig iron, ferroalloys and steel in electric furnaces in 1918 was about 194,000 tons. The exports of steel during 1918, as per customs department records, included: Billets, blooms and ingots, 61,782 tons, valued at \$2,645,943, or an average of \$42.83 per ton; bars and rods, 105,285 tons, valued at \$10,312,657, or an average of \$97.95 per ton; steel rails, 12,952 tons, valued at \$575,062, or an average of \$44.40 per ton; wire and wire nails, valued at \$6,294,195; scrap iron and steel, 51,544 tons, valued at \$853,097, or an average of \$16.55 per ton, together with a large quantity of manufactured iron and steel goods. The record imports of iron and steel ingots and billets during the year were 3409 tons, valued at \$262,210. This item evidently does not include steel billets imported for the use of the Imperial Government. The United States trade record shows exports to Canada during the same period of 247,332 gross tons, of billets, ingots and blooms of steel valued at \$19,787,779, or an average of \$80 per gross ton.

SOUTH AMERICAN NEEDS

Opportunities for Extending Trade in Iron, Steel and Machinery

WASHINGTON, April 8.—Opportunities for the increase of American exports of steel to South America are detailed at length in a special report on "Construction Materials and Machinery in Chile, Peru and Ecuador," just made public by the Bureau of Foreign and Domestic Commerce. The pamphlet is the work of W. W. Ewing, a trade commissioner of the bureau.

It dwells at length on the present status of the construction industry in these countries, outlining most of the important projects that are under way. In Chile, it lists projects for \$12,000,000 worth of rail and construction, with \$887,538 of public works besides a series of irrigation enterprises.

Difficulty in securing structural steel shapes, it says, forced the Chilean Government to change from steel frame construction to reinforced concrete in the building of the railway shops at Bernardo. In the present work, which includes a locomotive erecting and repair shop, foundry and pattern storage, forge shop, warehouse, and power house, some 1600 tons of steel reinforcement is being used. Since 1908, the time of the acceleration of reinforced-concrete building in Chile, there has been a tendency toward increased consumption of steel products for this class of work, which includes the modern city building work and new plants and extensions to plants. The State railways are also building bridges in the south of Chile, using reinforced concrete. Although concrete buildings reinforced with rods and bars are constructed to a considerable extent, there has also been a demand for structural steel frame buildings surrounded with concrete.

"An industry has recently been established in Chile in which reinforcement is made by rerolling scrap materials," says the report. Many of the engineers do not look upon the material with favor, but some have permitted the use of three of the rerolled bars as a substitute for one of the new mild steel bars. On important work, new materials are preferred.

"The industries foremost in the consumption of steel products are nitrate properties, copper mines, railways, coal mines and city building work. The largest users of construction machinery in Chile are the American copper-mining interests. These companies employ a full range of equipment and tools both for construction and operation.

"Manufacturers of machinery for contractors must send representatives to sell and initially operate the equipments and look after operation complaints. Modern methods of work are not generally known except by a relatively small number of the best contractors. The native employees of the contractors are, in general, not sufficiently informed to select their machinery; hence the necessity for salesmen who are thoroughly familiar with the capacity, construction, operation and resistance of the machinery offered."

Steel Demands in Peru

Opportunities in Peru are not so large as in Chile, but the steel market in Peru is of fair importance, the principal consumption consisting of bars, beams, plates, corrugated sheets and shapes. The greater part of the iron and steel imported into Peru is destined for industrial purposes, although during the last few years its application to building construction has considerably increased, particularly in the city of Lima, where reinforced concrete building work has recently attained some importance. Of late, however, the demand for these products for building purposes has diminished as a result of the high prices.

"The sugar and mining industries are the foremost users of steel and iron; it may be safely stated that they consume 70 per cent of the total imports," says the report. "The sugar companies use great quantities of iron for tanks, boilers, shafting, etc., and the same may be said of the mining enterprises.

"Although iron mines exist in Peru, the lack of road facilities has prevented their exploitation. Peru is dependent on foreign countries not only for steel

and iron products but for the pig iron used in the local foundries.

"With a few exceptions, there has been little or no attempt by the general contractors or builders in Peru to use the advantageous machines for doing construction work. The mining companies, however, use drills, clam-shell buckets, mining cars, narrow-gage portable track, electric locomotives, air and electric hoisting engines, locomotive cranes, rock crushers and auxiliary equipment, such as pumps, portable lights, etc. The city of Lima has road rollers, and on one important steel-and-concrete building operation now being carried out in that city there is a Lidgerwood steam hoisting engine, as well as modern equipment for concrete mixing, elevating and the distribution of material by two-wheeled carts. One may note also the occasional application of industrial narrow-gage track and side-tilting dump cars on railway construction.

Steel from the United States

Ecuador also secures most of its steel from the United States, although only a very small quantity of iron or steel is used in construction in Quito. The roof framing of the Pasaje Royal, the arcade of Quito, was fabricated in Belgium and shipped knocked-down to Ecuador. Small section steel only is used to a limited extent in the capital, and this does not weigh more than .25 lb. per meter, or about 7½ lb. per foot. In Quito there is one foundry that does a small amount of special work. Galvanized iron is the material largely used for roofing on the coast, especially in Guayaquil. For the new water supply of the latter city a considerable quantity of reinforcing steel has been imported from the United States.

"The hardware dealers in Guayaquil," says the report, "carry small stocks of bars, which have been used principally for blacksmith and wheelwright work; they also import stocks of barbed wire for fencing, galvanized iron in plain sheets and corrugated, boiler tubes, metal cloth, etc. Rails are imported for the railways and some pig iron for foundry purposes.

"Aside from the contractors' machinery that is now being employed in Quayaquil, very little modern construction machinery and few tools are used in Ecuador. So little public work is being carried out, or has been done in the past, that modern facilities have hardly been considered or warranted. Very little machinery is used on any railway construction in Ecuador. In no case are the funds adequate for efficient construction. The engineers in charge have not succeeded in convincing their principals that the purchase of proper tools and machinery would be an economy rather than an expense."

G. F. S.

Products Needed in Brazil

"There is an unlimited demand for iron, steel, copper and brass in Brazil," declared Carl F. Deichman, American Consul at Santos, Brazil, on his arrival in St. Louis last week for a two months' vacation.

"Brazil also needs great quantities of agricultural machinery, electrical machinery, steam engines, dressed leather, leather belting, hardware, chemicals and oils," he added. "The people of Brazil also offer a big market for automobiles, none of which are manufactured there. The cotton growers are short of machinery.

"Despite the fact that the Brazilian markets practically have been monopolized by European shippers, Brazilian merchants have the greatest friendship for the United States, and would welcome more extensive trade relations. The one thing most needed to turn the tide of Brazil's imports from the markets of Europe to those of the United States is a fleet of vessels to ply between New York and the gulf ports and Brazil."

Chas. F. Ames & Co., Ltd., 90 West Street, New York, have been appointed to act as the sales department of the Platt Iron Works, Dayton, Ohio, manufacturer of pumping and power plant equipment.

The Erie Iron & Steel Co., Erie, Pa., dealer in iron and steel scrap, has opened a branch office in rooms 601-602, Real Estate Trust Building, Philadelphia. The company also has a branch office at Buffalo.

Price Stabilization Plan Does Not Succeed

Radical Differences Between the Industrial Board
and Railroad Administration Not Adjusted—
Numerous Conferences Do Not Bring Agreement

WASHINGTON, April 8.—The Industrial Board's program of price stabilization still hangs in the balance. The Railroad Administration still refuses to buy rails at the price fixed by the board. Until it does so, or until the price schedule is revised to satisfy Director General Hines and his purchasing committee, the Industrial Board is paralyzed.

After a week of conferences the matters at issue finally settled down to a conference between Chairman Peek of the Industrial Board and Mr. Hines, but wage conferences in which Mr. Hines had to participate caused further delays in their getting together.

Both sides of the conflict over the right of the Industrial Board to lay down prices which the Railroad Administration would have to pay have stuck resolutely to their hostile position. Secretary Redfield of the Department of Commerce, who first made public the program for the Industrial Board, has tried to play the role of peacemaker, but he has refused to accede to the Railroad Administration's demands.

Just what will be the final outcome no one here pretends to know. For even if the Industrial Board yields, and makes another cut in the rail prices, as demanded by the Railroad Administration, there is little in the situation to promise a real acceleration of business. And that was the original plan upon which the whole project was founded. For a time last week it looked as though the Industrial Board would be wrecked completely as the result of the conflict. Nor is that danger past. If it cannot find a basis for rail prices which the Railroad Administration will accept it seems futile to tackle the long list of other commodities upon which the board has planned to pass judgment. To make matters worse, the delay in putting the machinery into motion has gone far toward demoralizing the whole situation. Nothing that has happened in the controversy has helped to strengthen the public confidence in the operations of the board. For that reason there is grave doubt in Washington whether its future activities can convince the public that the prices it fixes will be the lowest to be reached this year. There have been no indications so far that the prices already established have stimulated any large amount of business.

The bids opened by the Navy last Friday for 20,000 tons of steel for the battleships Nos. 49, 50, 51 and 52, were all made on the basis of the prices agreed to. This, however, cannot be looked upon as business stimulation, as these orders would be forthcoming at any price.

President Not Heard From

So far, President Wilson has refused to take a hand in the conflict between the Railroad Administration and the Industrial Board. The cablegram sent to him by Secretary Redfield has gone unanswered. The fact that Secretary Glass of the Treasury Department has come out vigorously in behalf of Director General Hines has probably had much to do with this situation.

Just what will happen if the deadlock continues, no one ventures to predict. The railroads are now receiving approximately 40,000 tons of rails a week on the pre-war orders. Since they have about 500,000 tons still to come, this would bring the end about July 1. But already some of the roads that need steel have received their full quota and the necessity for new orders is becoming more pressing.

The various conferences which have been held have

been in secret. The statements which have been made by the participants have been vague. Even now it is difficult to determine exactly the chief point at issue in the controversy. Mainly it seems to center about the contention of the Industrial Board that it was created to find a basis for commodity prices which would be fair equally to the public and to the Government purchasers. The contention of the Treasury Department and the Railroad Administration is that the purpose of the board was to find a basis for Government purchases that would stimulate Government buying without reference to the public. On the basis of the latter contention, the board would have nothing to do with the question whether the steel plants could make rails at a profit or not. The Industrial Board contends that the steel companies should make a profit on the railroad business as well as on the public business; otherwise the public would have to pay higher profits.

Members of the Industrial Board declared that their consideration of steel prices was based on careful estimates of costs made by the Federal Trade Commission as well as on the information furnished by the steel companies.

Cost of Making Rails

On the question of rails, these figures, it is claimed, showed that only one of the five railmaking companies—the United States Steel Corporation—could produce rails at a profit on the basis of the Industrial Board's price. The other four companies—the Midvale, Bethlehem, Lackawanna, and Colorado Fuel & Iron companies—would make no profit—two of them would do business at a direct loss, the other two would come out about equal. Which two the board would not say.

After a conference with Chairman Peek yesterday morning, Secretary Redfield sent a letter to Director General Hines, insisting that the conflict could be smoothed out, and declaring that the Industrial Board desired to do so. In his letter he asked the Railroad Administration to submit the figures upon which it based its contention for lower rail prices. It was declared that at Saturday's conference of the steel experts of the Railroad Administration with the Industrial Board this question was put five times to the railroad representatives, but that they offered no data in support of their claim for lower prices.

"The Industrial Board is ready at any time to consider all the information that can be brought before it," said Secretary Redfield. "There is no ground for discord. The board is ready to pass upon every item of information that can be brought to it and to make any revision that would be considered fair.

"But the Department of Commerce cannot be used as an instrument for bringing down wages in view of the present high cost of living."

The latter statement of Secretary Redfield apparently bears on the contention that if only the Steel Corporation can make rails at prices lower than those fixed by the board, it would force out of employment a considerable proportion of the payrolls of the competing companies and thus help to push down the price of labor.

Attorney General Palmer has not yet passed upon the legality of the whole plan. The fact that he has not done so is in itself a vital one. For, in certain quarters, it has been assumed that he considered the operation of the board as entirely legal. As a matter of fact, Mr. Palmer has declined to commit himself, and is still

waiting for a definite statement of the results of the board's action before he ventures a decision. Under the law, Attorney General Palmer could only give such an opinion to Secretary Redfield, in whose department the board is operating.

The chief result of the conferences of last week was to emphasize the differences of opinion between the opposing factions, led by Secretary Glass and Director General Hines on one side and Secretary Redfield and Chairman Peek on the other. The first one was held Wednesday, with these officials and the members of the Industrial Board as the chief participants.

A Stormy Conference

Wednesday's conference was a stormy one. After four hours the divergent views of Secretary Redfield and Director General Hines formed the basis for vigorous debate. But when it was all over the situation was worse than before. The Railroad Administration had refused to yield, and Secretary Redfield and Chairman Peek of the Industrial Board had refused with equal vehemence to accept the attitude of the Railroad Administration. There were threats of resignations, but they did not materialize. Hopes that President Wilson might interfere also failed to take definite form. As it was Secretary Redfield who had put the matter up to the Chief Executive, the fact that the President cabled no reply helped the Hines faction more than the Redfield-Peek allies. All efforts on the part of the Industrial Board to force the Railroad Administration to accept the steel schedule failed. Director General Hines insisted that his experts had gone into the details of rail prices and had reported to him that they were too high. From this position he would not budge. He refused to accept the claim of Secretary Redfield that the participation of Thomas C. Powell, Director of Capital Expenditures for the Railroad Administration, as a member of the Industrial Board had bound the administration.

This brought to light the real basis of the controversy. Ever since Secretary Redfield announced the program for the Industrial Board, early in February, he had maintained that its purpose was to find a basis for commodity prices which the Government purchasing agents would be bound to accept. Their acceptance would then be used to induce the public to purchase on the same basis. As far as the newspaper men with whom Secretary Redfield conferred were concerned, the whole scheme was the product of the Department of Commerce, with the advice of William M. Ritter, a Southern hardwood lumberman, who was later put on the board.

At Wednesday's conference it developed that Secretary Glass claimed the credit for the initiation of the scheme, and that his view had been to have a board which would co-operate with the Railroad Administration in framing a schedule of prices that the administration would accept. The idea of public purchases seemed entirely subsidiary in this plan. The vital difference lay in the view that the decisions of the board should bind the Railroad Administration only by the latter's full consent, after the prices had been worked out.

Wrecking of Board Threatened

The flat refusal of the Railroad Administration at Wednesday's meeting to accept the steel schedule, or to agree to accept any future schedules that the board might adopt, threatened to wreck the whole Industrial Board plan. It was on this plea that the whole question went back to the Industrial Board "for further consideration."

But the storm did not stop there. Secretary Glass, who had presided at the conference, was entrusted with the difficult task of trying to explain to the newspaper men why all the noise in the conference room had

really been conducive to governmental harmony. The other participants in the conference declined to talk. Mr. Glass decided it was best not to submit to newspaper questioning, and gave out the following statement:

"The steel prices approved by the Industrial Board of the Department of Commerce not having been accepted by the Railroad Administration, the views of both were expressed at the conference. The views of the Industrial Board were expressed by Secretary Redfield and Mr. Peek and other members of the Industrial Board. The views of the Railroad Administration were presented by Mr. Hines. The matter was recommitted to the board for further consideration."

This statement failed to satisfy Chairman Peek, who considered himself an equal participant in the conference with the representatives of the Treasury Department and the Railroad Administration. When it was shown to him by the newspaper men, Mr. Peek, on his own authority and that of Secretary Redfield, added the words "with the Railroad Administration," to the last sentence of the Glass statement, so that it read:

"The matter was recommitted to the board for further consideration with the Railroad Administration."

Secretary Glass did not see the amended statement until it appeared in the newspapers on Thursday. Then there was a new eruption. To the accompaniment of a vigorous comment, which was not made for publication, Secretary Glass gave out the following statement:

"Nobody was authorized to add to or to subtract from the statement I gave out last night. The amendment made by Mr. Peek, in my judgment, was totally misleading. The matter was not recommitted for any specific purpose, but the whole subject was recommitted for consideration and no suggestions were made as to how this should be done."

Later Conferences

Although all the subsequent conferences have been with the Railroad Administration, this bit of personalities did not ease the situation. It was evident that the life of the Industrial Board and of the whole stabilization project was at stake. The question of reconsidering the steel schedule had been met by suggestions that the board would refuse to take the matter up anew. On this point Chairman Peek issued the following statement on Friday:

"I have never said nor intimated that the Industrial Board would 'stand pat' on the prices formulated with the steel industry, no matter what objections were brought by other departments. Shown good and sufficient reasons for doing so, the board will reconsider. With wisdom it could pursue no other course."

In the meantime, efforts to bring the Industrial Board and the Railroad Administration to a more amicable discussion made little progress. Mr. Hines felt that the board should take it up with his own experts rather than with himself. A conference was scheduled for Friday, at which R. S. Lovett and Henry Walters, of the advisory purchasing committee of the Railroad Administration; H. B. Spencer, Director of its Division of Purchases, and Commissioner C. C. McCord of the Interstate Commerce Commission, were to represent Mr. Hines. Mr. Walters' return to Washington was delayed, and the first session of this conference was held on Saturday. John Skelton Williams, chairman of the Advisory Purchasing Commission, did not participate.

But after the commission had worked with the Industrial Board for five hours trying to find a basis for agreement the meeting adjourned to permit the Railroad Administration's members to report to Mr. Hines. It was then announced that Mr. Peek and Mr. Hines would attempt to carry on the negotiations personally.

Despite the Department of Commerce program to

stimulate business by promising lower prices, the Department of Labor is asserting persistently and consistently that prices will not fall, and that wages must not. Its chief ammunition is the article prepared by Prof. Irving Fisher for the mayors' and governors' conferences declaring that prices will not fall from the present level. This has been sent out by thousands of copies at Government expense, and under Government frank. As if this were not enough, Roger W. Babson of the Department has been adding his personal views indorsing the Fisher attitude, and followed this up by a statement, again mimeographed and mailed by the Department of Labor at Government expense, in which Mr. Babson again certifies to the belief that wages are not to be lowered. The statement as issued by Mr. Babson follows:

The Babson View

The recent decision of the steel men in their agreement with the Industrial Board of the Department of Commerce shows that it is useless to count on lower wages in the production of steel, according to Roger W. Babson, Director General of the Information and Education Service, Department of Labor.

"The Board has provided very distinctly for the maintenance of wages in the steel industry," says Mr. Babson. "Its ruling reads, 'It is fully understood and expected that the present wage rates or agreements will not be interfered with, the approved prices having this end in view.' That will be the wage policy in general.

"For that reason, builders who use structural steel will serve no useful purpose for their own interest, and will hamper the restoration of public confidence in business, if they delay any longer putting under way steel construction that is now required. America is

short of almost every kind of construction, and builders have held off because they hoped for lower wages and prices. The prices that have now been fixed will continue in force for a long time, and no reduction in wages of any importance need be looked for.

"Already there have been encouraging indications of revival on the part of the steel industry, even before the price scale was announced. Letters received by this service show that orders are coming in to steel plants in gradually increasing number, and some steel and iron plants already working full time contemplate extensions and the employment of larger forces. The stabilization of steel prices should result in a greatly increased volume of business, and steel men believe that there will result little hardship to them, if any.

"I want to make it as clear as possible that no important wage reductions need any longer be looked for. In the first place, wages are not high as compared with prices. Statistics show that prices have advanced, so far as the cost of living is concerned, about 65 per cent in the United States during the war. Wage rates on the average have not increased that amount.

"Moreover, business cannot be prosperous unless the workers are well paid. Lord Leverhulme has told the British manufacturers that 90 per cent of their customers are the workers of Great Britain. Probably the same proportion holds right here at home. We are not making goods to sell to Mars, but to people right here in the United States—working people; and those people cannot buy anything if they are not working."

After a 30-minute conference to-day, Messrs. Peek and Hines agreed to meet again on Thursday. Neither would discuss the progress made toward a solution, but the fact that they will meet again is looked upon as a sign that an agreement may yet be reached.

O. F. S.

Gear Manufacturers' Meeting

The annual meeting of the American Gear Manufacturers' Association will be held at the Hotel Statler, Cleveland, April 14-16. At the opening session Monday the annual address will be presented by F. W. Sinram, Cleveland, president of the association. The program Tuesday will include the presentation of the following papers:

"Gear Steels," by F. Heber Parker, Carpenter Steel Co., Reading, Pa.

"Worms and Worm Wheels," by G. W. Carlson, Timken-Detroit Axle Co., Detroit.

"Proper Sizes and Materials for Gears for Tractor Construction," by E. J. Frost, Frost Gear & Forge Co., Jackson, Mich.

Wednesday will be devoted to a business session and committee meetings. Standardization will probably be the most important topic to be taken up during the business meeting.

Reimbursement of Producers of Manganese and Other Ores

WASHINGTON, April 8.—Secretary Lane of the Interior Department has issued the regulations for the reimbursement of producers of manganese, chrome, pyrites and tungsten, who suffered losses when the armistice was signed. This is to be done under the special section of the Contract Validation law, which provided that not more than \$8,500,000 was to be expended for this purpose under Secretary Lane's direction.

The questionnaires which the department has issued cover comprehensively the entire wartime operations of each claimant. Three copies of the questionnaire, filled out and sworn to, must be sent to the War Minerals Relief Commission, Room 2131 Interior Department Building, Washington.

The document lays particular stress on the fact that no claims can be considered in connection with the production of any other mineral than manganese, chrome, pyrites and tungsten.

Building a New Shipyard

MILWAUKEE, WIS., April 7.—The Wisconsin Shipbuilding & Navigation Corporation, organized by Milwaukee and Wisconsin interests with an authorized capital stock of \$5,000,000, expects to begin actual work on the construction of its yard, ways and drydock at Kewaunee, Wis., shortly after April 15.

It is officially announced that the Wisconsin company has taken contracts through the Thomas Engineering Co., 133 Liberty Street, New York, for building two 1000-ton steel vessels for the Brazilian Government at a price of \$466,500, of which sum one-third is a cash advance. The contract also gives the Wisconsin company the exclusive rights to the use of a floating drydock system, controlled by the Thomas company, on the Great Lakes.

Disposes of Truck Department

The Chicago Pneumatic Tool Co., Chicago, has disposed of the Giant truck department of its business, and will confine its operations hereafter to its pneumatic tool, electric tool, air compressor and oil engine lines. The entire truck business, consisting of the Chicago Heights plant, stock of trucks finished and in process, inventories, and the agencies and branches with their stocks, have been transferred and the business will be continued by the purchasers as a going concern, probably under the title of the Giant Truck Corporation.

New Rennerfelt Furnaces

Hamilton & Hansell, 13 Park Row, New York, agents for the Rennerfelt electric furnace, have sold two furnaces, one of 1½-ton capacity to the Liberty Steel Corporation, Morristown, N. J., for making tool steel, and a 1200-lb. furnace to the American Metallurgical Corporation, Conshohocken, Pa. This furnace will be operated jointly by the latter company and Hamilton & Hansell in experimental and research work.

STEEL RESEARCH LABORATORY

Carnegie Institute of Technology to Have Experimental Rolling Mill

The decision of a number of officials of the leading steel and engineering companies manufacturing rolling mill machinery to install an experimental rolling mill and bureau of rolling mill research under the auspices of the Carnegie Institute of Technology at Pittsburgh, marks, it is believed, not only the beginning of an advance in the art of rolling steel and other metals in this country, but an equal advance in the spirit of co-operation among American manufacturers which the industrial leaders have long strived to obtain, and which they recognize as absolutely necessary if this country is to retain its industrial supremacy during the coming period of reconstruction.

This bureau of rolling mill research will have four distinct functions:

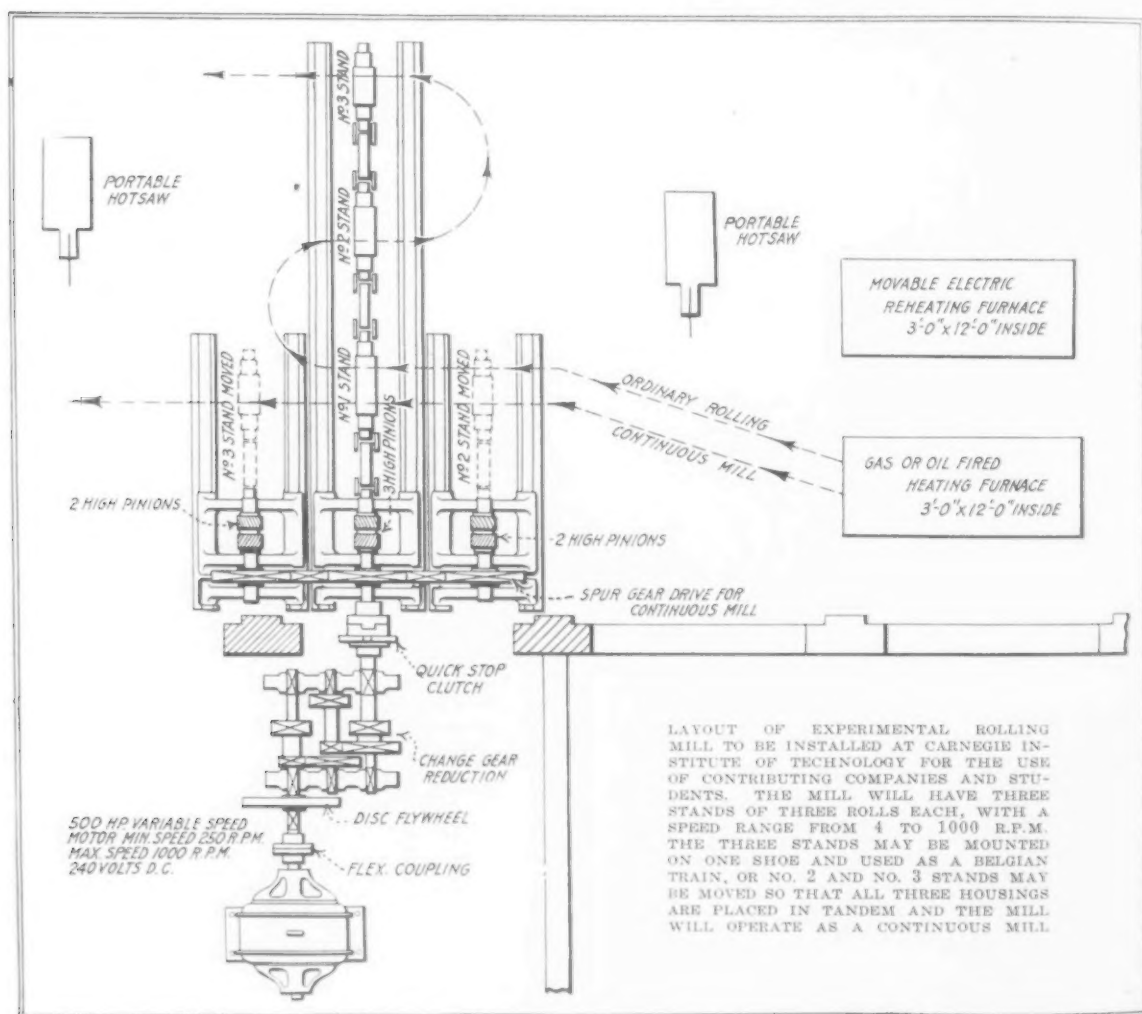
- (1) To investigate and study the physical and mechanical changes taking place in steel and other metals, and the power consumed, during the process of being rolled at various temperatures and speeds.
- (2) To distribute the information obtained by means of

tions between 4 and 1000 r.p.m. may be obtained. This wide range of speeds will enable a careful study to be made of the effects of speed on power consumed, and physical properties of the steel when rolled and treated under varying conditions.

Both the mill and the drive will be equipped with a complete set of automatic recording instruments and changes in their readings under the varying conditions of rolling will be recorded. The special stand for measuring the spreading force on rolls is to be equipped with hydraulic cylinders so arranged that the work done to overcome friction at the roll necks is automatically separated from the work done in rolling the steel.

Another feature of the mill will be a quick action stop clutch. By means of this clutch the mill may be instantly stopped while a bar is passing through the rolls. In practical mill work a roller often has to wait days and sometimes weeks before he can catch this condition, as he could not consider the stopping of production while he made a cobble in some particular roll pass that was giving him trouble, and it is mainly by studying the cobbles that the action of the steel can be observed and studied.

By stopping the mill and catching a bar in the rolls the exact action or flow of the steel in that particular pass and with the particular set of conditions



these experiments among the co-operating firms in order that they may put it into commercial use.

- (3) To provide laboratory facilities in which the contributing companies may conduct experiments and investigate designs of rolls for the production of new sections which they wish to place on the market.

- (4) To offer courses of instruction to students employed by the contributing interests and to those students who are to specialize in this field and are registered at the Carnegie Institute of Technology.

As planned at present the mill will consist of three stands of three high rolls driven by a 500-hp. variable speed electric motor. The drive and change speed gears will be so arranged that any number of revolu-

under which the mill is operating will be permanently recorded in the section of bar being pinched by the rolls

The rolls will then be opened and the bar withdrawn and studied. By this means a student can gain more experience in the rolling of steel and knowledge of the flow of steel during rolling in one year than could possibly be gained in many years' work on a commercial mill.

The illustration shows a layout of the mill and drive. The three stands may be mounted on one shoe and used as a Belgian train with No. 1 stand as a rougher, No. 2 stand as strand or leaders, and No. 3 stand as finishers; or No. 2 and No. 3 stands may be moved

so that all three housings are placed in tandem and the mill will operate as a continuous mill.

When operating in this manner only the two upper rolls would be used, the lower ones being left out and the space for their neck bearings filled up. In order to drive the continuous mill a train of spur gears is located just outside the pinion housings, the large driving gears being mounted on an extension of one of the pinion necks. Idle gears between are carried by separate adjustable bearings. By means of a spur gear instead of the usual bevel gear drive used on continuous mills, the reduction ratio between the stands may be altered by changing only one gear instead of two.

In this manner it is hoped that the actual conditions existing in the mills of the contributing members of the bureau may be easily duplicated in the laboratory, thus enabling any member to experiment on problems arising in his business under conditions which duplicate those in his mills, without excessive expense or without the losses incident to tying up a producing department.

The bureau will be under the control of a research committee, who will be composed of members appointed by the contributing interests, and representatives of the Carnegie Institute of Technology. The entire department is to be operated on a no-profit basis, and all funds subscribed for this work and not used will be returned to the subscribers.

Among the many problems where research work can be done and on which more information is badly needed by rolling mill engineers are:

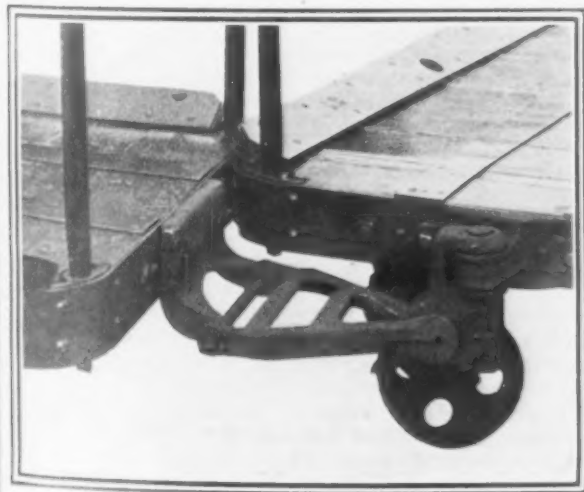
- A—Separating forces acting on rolls and housings
- B—Influence of speed on separating forces and on roll resistance.
- C—Ratio of roll neck friction to total roll train resistance.
- D—Influence of roll diameter, steel temperature, roll velocity and form of projected contact area on spreading.
- E—Greatest deformation which plastic material can undergo without injury, while being rolled.

It is planned to demonstrate to students who are studying rolling mill engineering and roll pass design the following phenomena:

- 1—Effects of separating or closing the rolls.
- 2—Effects of "crossing" the rolls.
- 3—Metallurgical effects of many light passes.
- 4—Metallurgical effects of a few heavy passes.
- 5—Rolling of shapes, and merchant material.
- 6—Study of plastic deformation and lines of flow.
- 7—Forward slippage in rolling.

Coupler for Tractors and Trailers

H. M. Woodward, the designer of the electric industrial tractor manufactured by the Lansing Co., Lansing, Mich., has perfected the Carlton coupler for use on tractors and trailers. It is adaptable for use on the four-wheel hand truck, having two load wheels at one



Carlton Coupler Perfected for use on Tractors and Trailers

end and two caster wheels at the other, and can be used for either pushing or pulling trailers.

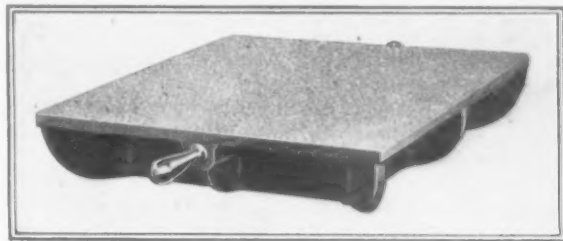
It is claimed that the coupler is easily coupled or uncoupled and allows trucks to be operated at an angle with each other up to 90 deg., and prevents side play

going forward, backward or turning. It is so designed that when trailers are coupled they are separated by a little more than half their width. The coupler can be used practically as it comes from the foundry, and can be coupled to trucks which have the ordinary hook and eye coupler.

Mr. Woodward says that the Carlton coupler will be available to all builders of trailers commonly known as the Reynolds type, the only construction conditions imposed being that the couplers be attached as interded, that the load axles be properly spaced and that the original dimensions be rigidly followed in making patterns, so that the trailers of one builder will be usable with those of another.

Cast Iron Surface Plate

The United Machine & Mfg. Co., Canton, Ohio, has added to its line of products a cast iron surface plate with a thick top and webbing 2½ to 6 in. deep, depend-



This Strainer Plate Is Exposed to the Weather Before Finishing to Remove Strains and Give the Metal a Permanent Set

ing on the size of the plate. The handles are of steel, threaded and screwed into the plate.

In making the plates the casting is first given a rough cut on a planer, then exposed to the weather for some time under the steam of an exhaust pipe to remove the greenness from the casting. The second cut is then taken, and the plate is again exposed to the weather for several weeks. This is followed by a finishing cut and another exposure for a week, after which the plate is scraped. This process is to remove strains from the castings, and give the metal a permanent set. The plates are made in eleven sizes, ranging from 6 x 12 in. to 30 x 60 in., and weigh from 19 to 820 lb.

Annealing Carbon Electrodes

For annealing the amorphous carbon electrodes used in electric steel furnaces, the Davis Furnace Co., Luton, England, has made for a large steel works in the Midlands, which have an annual output of electric steel exceeding 30,000 tons, a gas-fired furnace which is 9 ft. wide by 5 ft. deep and 9 ft. high and which can take six electrodes of sizes up to 22 in. in diameter. The walls are made of special refractory material, 9 in. thick, and the heat is obtained from six "fan-air" burners consuming town gas under a slight supplementary air-pressure of about 6 in. water-column. The burners, which have each a 1¼ in. gas service and a 2½ in. air supply, are placed three on each side of the furnace, and fire into combustion chambers or tunnels 12 in. wide by 5 in. high, arranged under the floor of the heating chamber. The operation of annealing requires the accurate maintenance over long periods of temperatures ranging from 450 to 600 deg. C., and the best results are obtained if the electrodes are annealed in a vertical position.

Tests by the London Hydraulic Power Co., London, England, it is stated, showed considerable economy when coke was mixed with coal for its water-tube boilers. Coke was added in proportions of from 30 to 75 per cent. The steaming capacity of the boiler was increased by over 20 per cent, and the over-all efficiency rose from 61 to 70 per cent.

The Smooth-On Mfg. Co., Jersey City, N. J., announces that it is making a cement suitable for attaching wood handles to tools such as hammers, screw drivers, chisels, files, etc.

MACHINE TOOL PRICES

Few Manufacturers Favor Reductions, but Buyers Look for Readjustments

In the April issue of *Machinery* Alexander Luchars, the publisher, presents and reviews a number of letters from machine-tool manufacturers on the question of machine-tool prices. The discussion is timely because of the widespread expectation among buyers that prices of machine tools are due for a general reduction, and this feeling unquestionably is holding back much business which would otherwise be placed. Few of the manufacturers quoted by *Machinery* are in favor of a reduction in prices, except that, as one manufacturer puts it, those who have been selling on an "abnormal price basis" should bring their prices down. In most instances, the letters point out, the advances in prices were justified by increasing costs of labor and material, and these costs have not come down sufficiently since the ending of the war to justify such sweeping reductions as some prospective buyers profess to believe possible. Mr. Luchars, in summing up the opinions of manufacturers, says:

"From the statement of manufacturers and dealers and from facts with which the writer is familiar, these conclusions may be reached:

"The large and most of the smaller well-known established machine-tool manufacturers have not raised prices except when it was necessary to make a fair profit. Many of them could have obtained more than they did for their product during the war demand; but they considered it bad policy, their idea being to get a fair return rather than, as the head of one of the leading concerns in the country, whose reputation is world-wide, expressed it, 'to jump the peak and drop down suddenly.' His opinion is that reductions do not stimulate machine-tool purchases, for tools are bought when they are needed, rather than when they are offered as bargains.

"The great majority of manufacturers, including all the largest except one, feel that there has been no reduction in costs warranting a general reduction in prices. All agree that manufacturers who have advanced prices excessively should reduce them to normal figures. All agree that there is no prospect of any material reduction in labor costs, and that it is not desired in view of present living costs. All do not agree that a price reduction will stimulate buying; most think it will not. The prices of materials have been slightly reduced, but not enough to warrant any considerable reduction on the finished products. The reduction in the cost of material, allowing for the reduction now in effect, varies from 4 per cent to 8 per cent on the cost of the tools, according to the proportion of raw material used. A reduction in cost is to some extent practicable on account of the increased efficiency of the workmen under present conditions; but that may be offset by the increase in overhead caused by reduced output.

"The price reduction question is like an endless chain, and while it is true that price reductions must start somewhere, it seems reasonable that they should start with what may be called fundamentals—that is, raw material, food and living expenses, rather than with finished product.

"Labor costs and the prices of all products are established on high levels and we shall never see a return to pre-war prices. This should be considered carefully in making price adjustments, or they may be adjusted to levels that mean a loss which cannot be made up. It would be a great mistake to reduce wages under present conditions; a part of the manufacturer's profit must come from increased efficiency, and from the saving on wasteful methods that prevailed under war conditions.

"The prevalent idea among those not acquainted with the facts is that all machine-tool manufacturers made enormous profits during the war. Some did; but they are exceptions. As a class, machine tool manufacturers have not made as large profits as many others, such as powder manufacturers, munition manufactur-

ers, or even farmers. When the armistice came suddenly many had contracts canceled, virtually without notice; and nearly all had stocks of material bought and partly finished machines produced at high prices. Many don't know yet what they have made, for they haven't got the money due them and don't know when they will.

"There is an encouraging number of inquiries and a fairly good volume of business, especially in tools required for the manufacture of automobiles, trucks, tractors and agricultural machinery. But many buyers are apparently waiting to see what the price policy of manufacturers is to be.

"The opinion of the writer [Mr. Luchars], who has no interest to serve except that of the machine-tool industry, is that excessively priced tools should be reduced to meet present conditions and that a reduction should be made on others to prices which will yield a fair living profit, allowing for recent reductions in material. But one essential to stabilized conditions is that manufacturers should decide what they intend to do, should make their decision generally known and should stand by it. There should be no legal objection now to an agreement on prices, for that principle has just received the sanction of the Government, and if these can be established the danger of price-cutting will be averted. This may be called a readjustment rather than a reduction; but unless some such action is taken, individual manufacturers will continue to cut prices and buyers will hold off, waiting for such cuts, so that the general market may become demoralized. A heavy and general reduction in prices would resemble a surgical operation that was necessary to save a man's life. The machine-tool industry is not in that extremity."

New American Business Headquarters in Paris

The American Chamber of Commerce in France has established itself in new rooms at 32 rue Taitbout, Paris. Its membership is now 471, of which 305 are resident. The chamber is planning to add 250 new members this year and is looking to commercial interests in the United States to avail themselves of its position for fostering their trade in France in return for the support their membership gives and its conveniences afforded to their representatives while in Paris. Recent non-resident membership proposed include the Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa., the Central Steel Co., Massillon, Ohio, and J. A. Steinmetz of Janney, Steinmetz & Co., Philadelphia. The chamber issues a fortnightly information leaflet to its members.

All American citizens, firms and corporations of good standing, interested in the objects of the chamber, are eligible for active membership. Annual dues of active members, including admission fee, are 250 francs for resident members and 125 francs for non-resident members. Application blanks and information may be obtained from its secretary.

Herman A. Holz, metallurgical engineer and manufacturer of metallurgical and magnetic testing apparatus, has moved his office and laboratories to the Pullman Building, 17 Madison Avenue, New York, occupying the third floor. The laboratories will contain up-to-date equipment for experimental heat treating, hardness and impact testing, micro and micro-photographic investigation of metal sections, apparatus for magnetic measurements and for investigating the mechanical properties of steel products by determination of their correlated magnetic characteristics, as well as equipment for X-ray work on metal products.

The Ludlum Steel Co., Watervliet, N. Y., has leased 7500 sq. ft. of floor space in the Siegel Building, Detroit, and has fitted it up as a warehouse to handle a large stock of high-speed and carbon tool steel. The company has facilities for taking care of rounds up to 10 in. diameter. William A. Edwards is manager of sales in charge.

SIMPLE SULPHUR EXTRACTOR

Novel Device for Steel Analysis Eliminating Bad Features of Older Methods

An interesting and simplified form of apparatus for the rapid evolution method for the estimation of sulphur in iron or steel has been devised by H. Joshua Phillips, author of "Engineering Chemistry." It was incidental to some recent research work in electric furnace steel melting practice. It requires no stands, clips or separate Bunsen burners, several determinations being simultaneously accomplished on the hot plates or sand baths, essential features of steel works analysis. It is called the Phillips neutroscope.

As the illustration shows, the apparatus consists merely of an Erlenmeyer flask, into which is fitted through a rubber stopper a group of bulbs so constructed as to insure the complete assimilation of the sulphuretted hydrogen evolved, by any of the well-known absorbents, without fear of the liquid being ejected out of the bulbs, or sucked into the flask on cooling after the reaction is completed. Splashing of the acid liquid from the flask into the bulbs is also prevented by the form of the central exit tube E, and pear-shaped bulb F, constituting a splash trap. The operation of the apparatus can best be exemplified by detailing the procedure of actual estimation:

(50 cc. of H_2SO_4 (1 in 5) was introduced into the flask G and 10 cc. of concentrated NaOH poured into the bulbs (while detached) through the thistle funnel A; 5 grammes of standard gun-steel turnings, known to contain 0.039 per cent of sulphur were quickly dropped from a piece of glazed paper into the flask containing the acid. The bulbs were then quickly fitted into the flask and placed on the hot plate. The gaseous mixture of hydrogen, H_2S , and hydrocarbons immediately started bubbling through the NaOH, the H_2S being fixed as Na_2S . When all the steel was seen to be dissolved and the gases practically ceased to be liberated, the flask was pushed to the hottest part of the plate and the solution of steel raised to incipient ebullition. The bulbs were then carefully detached and the caustic liquor containing the sulphur was poured and remnants washed with water into a 100-c.c. flask containing a mixture of 20 c.c. (1 in 5) H_2SO_4 , and exactly 5 c.c. of standard iodine solution (3.9 grammes of pure iodine and 8 grammes of potassium iodide dissolved in water and diluted to 1,000 c.c.). 1 c.c. of this being equivalent to 0.010 per cent of sulphur on 5 grammes of sample. The excess of iodine was then determined by titration, with an equivalent standard solution of sodium thiosulphate, using starch solution as the indicator, when 2.1 c.c. was required to decolorize the blue iodized starch thus: $5 - 2.1 \times 0.01 = 0.029$ per cent sulphur.

The bulbs can, of course, be used with other absorbents, including oxidizing agents, such as brominated HCl, or HCl and KClO_3 , with subsequent precipitation, as BaSO_4 , and estimated gravimetrically. By a modification of the apparatus it is expected also to estimate nitrogen in manures and ammonia in gas liquor and sulphate of ammonia.

The house of W. J. Rainey, 52 Vanderbilt Avenue, New York, dealer in coke, has opened branch offices in the Real Estate Trust Building, Philadelphia, where it will be represented by A. F. Kempe, and in the Oliver Building, Pittsburgh, where the representative is H. B. Prescott.

Methods of Computing Labor Loss

Methods of computing the labor loss in an industry are explained in a pamphlet issued by the employment management branch, United States Shipping Board Emergency Fleet Corporation, Philadelphia, entitled "Handbook on Employment Management in the Shipyard." The treatise is made on the assumption that: "A half-way analysis is often more misleading than no analysis at all, as it leads to a feeling of satisfaction that the necessary factors have been considered whereas they have not, and the consequent oversight may cause disastrous conclusions to be arrived at." To quote again, "A regular and comprehensive audit of man power is necessary in order to determine when and where loss in man power occurs, so that this loss can be remedied and future wastes be avoided."

Labor loss is made up of the following prime factors: turnover, poor attendance and failure to keep the number of workers on the payroll regularly up to the standard requirements; secondary ones are lack of steady application to work, needless shifting of workers among departments, fatigue and lack of harmonious working spirit.

According to the pamphlet, "(1) turnover is based upon actual replacements; (2) loss in standard work force is based upon failure to maintain the proper number of workers on the payroll; (3) absenteeism and tardiness are based upon loss of time from the plant by workers who are on the payroll; (4) labor loss combines these factors."

The pamphlet shows typical labor loss curves, formulas and labor record blanks, which should interest the employment department of any industry.

Electricity in Oxygen Making

An interesting plant for the manufacture of oxygen and hydrogen is that of the Bettendorf Oxygen-Hydrogen Co., near Davenport, Iowa. It contains 100 I. O. C. type electrolytic cells and 200 Levin type cells. An electrolyte of caustic potash is used. Water is supplied to replace that broken up, so that the level of the liquid remains constant. An asbestos barrier is placed between the electrodes so that the two gases cannot mix. It is very important for the safety of the plant and of users of gas that it should be practically pure, since even a small percentage of one gas in the other will form an explosive mixture. Hence the manufacturer maintains a purity standard above 99 per cent for each gas.

Electrical power is used at 440 volts, 3 phase alternating current, and converted to direct current at 125



Electrolytic Cell Room at the Plant of the Bettendorf Oxygen-Hydrogen Co.

volts by means of four motor-generator sets, of which three are of Westinghouse make. Current is passed through a suitable number of cells in series to give the proper current. The gas is collected by a piping system and taken to outdoor steel gas holders. From here oxygen is delivered by a pump driven by a 15-hp. motor to the adjoining factory of the Bettendorf Steel Car Co., and hydrogen to the hydrogenating plant of Wilson & Co. Surplus gases are compressed into steel cylinders for shipment, the compressors being each driven by 10 hp. Westinghouse motors.

BRITISH METAL TRADES WAGES

Increases in 1918 Much Less Than in United States—Bonuses on Earnings

WASHINGTON, April 7.—The official *Labor Gazette* of the British government has compiled an interesting tabulation of the increases in wages during 1917 and 1918 in the United Kingdom. The figures cover an aggregate increase of \$13,500,000 in 1918—over the figures of 1917—in the weekly wages of over 5,650,000 people. In the figures for 1917 the increase was \$11,227,000 over the weekly wage of 1916 for 5,029,000 people. This makes a total increase for 1918 over the figures of 1916 of almost \$25,000,000, while in the preceding two years—1915-16—this figure was only about \$6,326,000 and in the previous five years of rising wages—1910-14—it amounted to less than \$1,947,000. The following table shows the figures affecting the metal industries:

Groups of Trades	Number of Work People Whose Rates of Wages Were Reported as Changed in—		Total Net Increase in the Weekly Wages of Those Affected, as Compared with the Preceding Year	
	1917	1918	1917	1918
Iron and other mining.	30,000	33,500	\$79,800	\$58,400
Pig iron manufacture.	35,000	34,500	97,325	104,625
Iron and steel manufacture	125,000	125,000	365,000	243,325
Engineering and shipbuilding	1,238,000	1,320,000	4,004,150	2,861,500
Other metal	251,000	396,000	599,550	784,975

"The most noteworthy feature of the wage movements of 1918," comments the *Labor Gazette*, "was probably the widely extended application of the bonus of 12½ per cent on earnings which, toward the end of 1917, had been granted to men engaged at plain time rates on munitions work in engineering and shipbuilding establishments. In January, 1918, it was arranged that this bonus, or its equivalent, should be granted to men employed at time rates on munitions work in the iron and steel, brass, hollow ware, tube, railroad car, wire, rope, nut and bolt, sheet metal, chemical, electrical, and various other trades, and that a bonus of 7½ per cent on earnings should be paid to men employed at piece rates or on other systems of payment by results, in the trades and occupations in which the bonus of 12½ per cent had been granted to time workers. At later dates during 1918 the bonuses were extended to men on munitions work in various other industries, including the building trade, aircraft manufacture, the furniture trade, gas undertakings, and leather manufacture. In a large number of cases all the men employed, whether engaged on munitions work or private work, eventually received bonuses.

Two Advances Apart from Bonuses

"Apart from these bonuses, the principal general increases were two war wage advances in the engineering, foundry, and shipbuilding trades, one in August of \$0.85 a week to men and \$0.43 a week to boys, and the other, at the beginning of December, of \$1.22 a week to men and \$0.61 a week to boys, granted under awards of the Committee on Production. As those for men were subject to the bonuses of 12½ and 7½ per cent, the total resulting increase on time wages was over \$2.30 a week. Following upon these awards, similar increases were given, in some cases under separate awards and in other cases by agreement between the employers and work people, to men and boys in many other industries, including the light castings, brass, tube, railroad car building, sheet metal, gas meter, nut and bolt, and various other metal trades, chemical manufacture, and soap and candle trade, and at electricity undertakings.

"Certain sections of work people in the engineering and foundry trade in a number of districts, and platers, angle iron smiths, riveters, calkers, blacksmiths, and some other classes of iron workers employed at piece rates in shipyards, also received further increases of varying amounts, under special arbitration awards. As regards women and girls employed on munitions work

in the engineering and other industries, wage orders, issued by the Ministry of Munitions in January and September, granted increases amounting to \$2.07 a week for those of 18 years and over, and \$1.03 a week for those under 18.

"During 1918 the changes in hours of labor reported affected over 120,000 work people, whose normal working time was reduced by an aggregate of over 450,000 hours per week. Of these work people nearly 55,000 were employed in the engineering and shipbuilding trades, 20,000 in the building trades, and 11,000 in the clothing trades. Toward the end of the year arrangements were made for the adoption, early in 1919, of a 47-hour week in the engineering and shipbuilding trades, of a 49-hour week for colliery surface workers, and of an 8-hour day for railroad servants."

British Industrial Relations Plans

The reports of the Whitley committee on relations between employers and employed of the Ministry of Reconstruction of Great Britain and related documents have been compiled by the Bureau of Industrial Research, 465 West Twenty-third Street, New York, in a pamphlet entitled "The Industrial Council Plan in Great Britain." According to the introduction: "One of the greatest tests of our democracy in the years immediately ahead of us will be the ability of American employers and wage-workers to find a basis of democratic cooperation in the government of industry. Unless industry can be constitutionalized on a democratic basis, there is serious danger of steady intensification of the class conflict culminating in some form of revolution." Through the plan of establishing industrial councils, which have already been set up successfully in England in 15 industries, the British Government hopes to solve these problems through the ministry of labor. Investigations were made through a committee, headed by J. H. Whitley, M.P., which made seven reports in the period of Oct. 20, 1917, to July 1, 1918.

England's Works Committees

A pamphlet has also been issued by the industrial relations division, United States Shipping Board Emergency Fleet Corporation, containing a "Report of an Inquiry as to Works Committees," made by the British minister of labor. The report is based on an inquiry as to the constitution and working of works committees in a number of different industries. In the appendix of the pamphlet is reproduced the copy of the questionnaire sent by the Minister of Labor to representative English industries. About 80 pages are devoted to the replies received. The conclusions reached are: Works committees have increased timekeeping, increased output, accelerated the pace of industry, made greater harmony, gained time by eliminating disputes, and "nipped grievances in the bud." From more than one works came the statement concerning the works committee: "This is the best thing that has ever happened in the shop."

The city of Sheffield, England, contributed 70 per cent. of the war material furnished by private firms in Great Britain during the war, according to a pamphlet issued by the city council. Among the other products made in local plants were guns and projectiles of all calibers, among which are submarine guns which rise automatically to position on deck as the vessel emerges from the depths and sink swiftly to their places of concealment when the boat is about to submerge after firing. The city also produced head and body armor for soldiers.

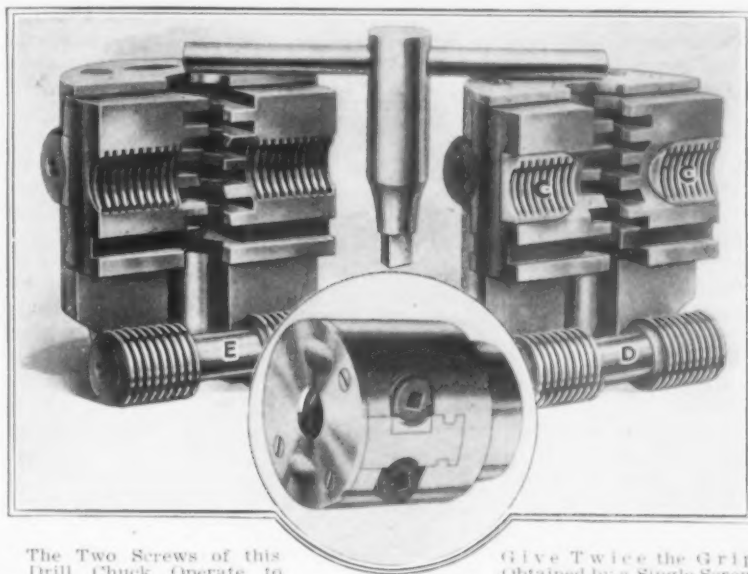
Net profits of the Canadian General Electric Co. Toronto, Ont., Can., for 1918 were \$1,436,483, an increase of \$302,886 over 1917. During the past four years the company made munitions valued at \$15,287,284 of which \$1,474,426 worth went to the United States Army. Early last year, anticipating the termination of the war, operations were directed along the line of marine engineering, orders valued at \$4,000,000 being carried forward on Jan. 1, 1919.

Twin Screw Drill Chuck

A drill chuck designed to combine accuracy with strong gripping has been placed on the market by Marvin & Casler Co., Canastota, N. Y. The body is made of close grain cast iron and the jaws and screws of high carbon steel, tempered, to give long life to the wearing surfaces. The body is reinforced by a steel cap plate to prevent it from spreading when under strain.

When using the chuck, the primary screw E is first operated to grip the drill shank between the jaws. After setting up the primary screw, the secondary screw D is operated so as to bring the floating nuts CC against the ends of the pockets in the jaws, resulting in a grip on the drill shank equal to twice the grip obtained by a single screw.

There are no projections which are likely to catch the work or injure the workman. All the parts are made of the interchangeable type.



The Two Screws of this Drill Chuck Operate to

Give Twice the Grip Obtained by a Single Screw

Steam and Oil Separator

The United Machine & Mfg. Co., Canton, Ohio, is placing on the market the Mosher steam and oil separator, having acquired the patents and other rights of Charles D. Mosher, New York. The separator is made in a horizontal type and a vertical and angle type. In operation the steam is caused to revolve through a helical path and foreign substance heavier than the steam is thrown outward by the centrifugal force and is repeatedly "shaved off" by the overlapping of slotted openings and delivered to a collecting chamber below, where it is isolated from the current of the steam. Features of the separator are the absence of baffle plates and the open unobstructed passage of the steam. It is claimed that the helicoid designed with long, tangent surfaces insures free passage of the steam current and absence of back pressure. The separator is adapted for use with boilers having small steam space and a very rapid combustion. It is being manufactured for use on lines from 1 in. to 48 in., and is furnished in cast iron for working pressure up to 200 lb. per sq. in. and in cast steel or steel boiler plate construction for higher pressures.

U. S. Training Service Pamphlets for Foremen

That the foreman occupies a strategic position in modern industry and hence should be a man thoroughly trained in approved methods is strongly emphasized by the U. S. Training Service of the Department of Labor, which has just announced that it has in preparation a series of monographs dealing with the special training of foremen.

The material in these discussions is being assembled from all parts of the country and from a great number of different industries. The pamphlets will endeavor to set forth in concise and yet sufficiently detailed form the approved practices for foremen in the performance of their various duties. The monographs promise to be a valuable addition to the literature dealing with industrial efficiency in that they will take up in a practical way each of many problems that the foremen must face.

It is pointed out that too little thought is given by many foremen to the proper handling of workers of

various temperaments and types. Too few understand how to make production charts and hence fail to appreciate their value. The great importance of setting properly determined standards of production for their departments and systematically endeavoring to attain those standards is too little understood among foremen. These are but a few suggestions of the problems which the coming monographs will treat.

Aside from a limited number of instances, no systematic effort has been made to determine what is standard practice for foremen. Indeed, the field is so vast it is not to be wondered at that few have tried to cover it. But the U. S. Training Service, with the facilities of a well-organized research department and a group of field experts at its command, has felt itself in just the position to undertake the much needed study. What it now has in preparation is based not only upon foremanship courses now in operation for the benefit of a limited number, but on the best information from all other possible sources.

This series of monographs is designed to be of practical value in making foremen more efficient. This question of upgrading foremen, it is emphasized, is but one phase of a great industrial problem which reconstruction days have brought to the fore—the problem of liberating industry and several million industrial workers from the handicaps caused by improper training of the latter in their respective tasks, or the lack of any training whatsoever.

When the literature now being prepared is ready for free distribution further announcement will be made in the trade papers. The Training Service, whose office is at 618 Seventeenth Street, N. W., Washington, has already completed several other pamphlets dealing with other phases of industrial training which are free for the asking. C. T. Clayton is director.



Sweden's Steel Output

The Swedish output of steel ingots and castings in 1917, according to the latest revised official figures, was as follows, as compared with 1916, in metric tons:

	1917	1916
Bessemer, acid	21,389	26,897
Bessemer, basic	56,456	49,134
Open-hearth, acid	215,391	244,752
Open-hearth, basic	275,866	283,937
Crucible	1,225	2,743
Electric	10,664	6,648
Total	581,000	641,111

In 1917 there were 18 Bessemer converters, 81 open-hearth furnaces, 8 crucible steel furnaces and 25 electric furnaces which compares with 16 Bessemer, 79 open-hearth, 9 crucible and 17 electric furnaces in 1916.

A booklet called "Trade with Australia" has been issued by the British-Australian Machinery Co., Ltd., for the purpose of bringing to the notice of manufacturers of this and other countries the company's trade facilities in Australia. The company is prepared to consider proposals from manufacturers who wish to enter the Australian market. The New York office is at 50 Broad Street.

The National Twist Drill & Tool Co. has opened a branch at 565 Washington Boulevard, Chicago, in charge of E. J. Chamberlain and W. S. Yates.

Joseph Esrey Johnson, Jr.

J. E. Johnson, Jr., consulting engineer and metallurgist, New York, met his death suddenly on the morning of April 4. While walking from his home in Scarsdale, N. Y., to the railroad station, he was struck by an automobile, and shortly after died in the hospital. Few men could be named whose passing would bring a more widespread sense of loss to iron and steel engineering.

Born in Longdale, Va., in 1870, taking his early training under a tutor, and later pursuing technical courses at Haverford College and Cornell University, receiving degrees in mechanical and mining engineering, he took up work in the drawing room of the Baldwin Locomotive Works in 1888. From 1890 to 1895 he was draftsman with the Straight Line Engine Co., and later was connected with the Oswego Machine Works. He became assistant manager of the Longdale Iron Co.'s blast furnace at Longdale, Va., under his father, in 1906, and was made general manager of the Princess Furnace Co., Glen Wilton, Va., in 1909. A year later he became superintendent of the Republic Iron & Steel Co. at Thomas, Ala., and from 1912 to 1914 was manager of the Ashland, Wis., blast furnace, charcoal and by-product plant of the Lake Superior Iron & Chemical Co. In the latter year he opened an office in New York as consulting engineer, and the ensuing five years have seen the establishment of a highly successful practice.

Readers of THE IRON AGE are indebted to Mr. Johnson for several notable contributions on metallurgical and economic subjects. For several years he wrote an annual review for this journal on the developments in iron and steel metallurgy in the United States. The range of his thinking on the problems of industry was unusual. Mr. Johnson's early work was in mechanical engineering. Later his career turned to mining and metallurgical engineering. His experience in industrial management led to several contributions to discussions on the relations of employers and men. One of these, which attracted wide attention, appeared in THE IRON AGE in 1913, under the title, "High Cost of Living is High Cost of Labor."

Many stories have been told of Mr. Johnson's personal courage. One of these related to an episode in Virginia in which Mr. Johnson, who was then in charge of blast-furnace operations, prevented the lynching of a negro. He himself had organized the search whereby the negro was captured, taken to the company office, and made to confess his crime. The crowd demanded lynching, but practically alone, and at great personal peril, Mr. Johnson, by alternate persuasion and threatening, held them at bay for several hours. Meanwhile, the sheriff was communicated with, a train was rushed to the plant, and the negro put aboard. At the county seat a special jury was summoned, and an indictment found, and the negro was executed under due form of law. The whole story is told in the issue of *American Law Review* for November-December, 1911, under the title "Lynching Unnecessary."

Bradley Stoughton, secretary of the American Institute of Mining and Metallurgical Engineers, probably Mr. Johnson's most intimate friend, has made the following estimate and appreciation of his work and character for the readers of THE IRON AGE:

"Joseph Esrey Johnson, Jr., had already achieved rare distinction as an able metallurgist, clear thinker, brilliant author, and wise consulting engineer to bankers and operators when death cut short his activities in the 49th year of his age. He belonged to a family of iron blast furnacemen and mine managers. His father, Major J. E. Johnson, after serving with distinc-

tion in the Union Army, identified himself with the iron mines and blast furnace at Longdale, Va., with which he was connected during almost his entire business life. It is significant that during these troublous times of reconstruction in the South he enjoyed always the affection and respect of his neighbors and associates alike. From him his son obtained not only a thorough training in blast-furnace practice and iron mining, but great personal courage and force of character. His mother, who survives both her husband and sons, possesses rare intellectuality, humor, and a tenderness and human sympathy which those who were privileged to know well J. E. Johnson, Jr., recognized beneath his exterior of aggressiveness and will power.

"In a recently published analysis of the qualities which characterize the world's great men, three traits stand out pre-eminent: Independence, courage, and intellectuality. Each of these characteristics J. E. Johnson, Jr., possessed in an extraordinary degree. His early education was obtained under a private tutor at Longdale, and this probably enhanced a natural tendency to independence of character and individuality which, however, under the control of his unusual power of straight thinking and clear analysis never allowed him to go far astray. His manner of attacking a subject involved first mastering the details of the available knowledge; then he put this acquired information to one side with an untrammelled mind, working out a solution of his own, so clear, so well defined, and expressed in such simple terms that he illuminated the whole subject

without distorting the original data or discussion. His two books on the iron blast furnace together form the most comprehensive, the most enlightening and the most useful treatise on the subject ever produced in any language.

"But his ability did not end with the mastery and elucidation of principles enunciated by his predecessors. His own discoveries and inventions in the metallurgy of iron have established his reputation in every civilized country where iron and steel are made. The three most important of these doubtless are his thermal theory of the iron blast furnace, which ranks with Sir Lowthian Bell's chemical practice of the iron blast furnace as one of the greatest scientific advances in our knowledge of the art; his original classification of iron and steel as an unbroken series of alloys of iron and carbon; and his discovery that oxide, instead of being the unmixed evil which it was accredited in the minds of most metallurgists, actually benefited the strength of cast iron.

"Johnson led a white life. There was no weak spot in his professional or personal armor of honor and sincerity. His home life was an unusually happy and congenial one. He married Miss Margaret C. Hilles of Wilmington, Del., and she was not only his friend and comrade but an intellectual stimulus and helpmate in a very busy life. She, with one boy, J. E. Johnson, 4th, survives him.

"I cannot give here a better summary of Johnson's professional attainments than by quoting from a letter from his friend, James Gayley. These two master minds found mutual sympathy and understanding. Johnson had an unbounded admiration for Gayley, whom he describes in the dedication of his books as the 'founder of modern American blast-furnace practice.' Gayley made of Johnson a pupil and gave him valuable advice and assistance during the early days of his establishment as a consulting engineer in New York. On the day of Johnson's death Gayley wrote to me as follows: 'American metallurgy of iron has lost its shining light and the world is poorer thereby.' * * * Esrey Johnson is and was the greatest man in the metallurgy of iron and the clearest thinker. He seems



J. E. JOHNSON, JR.

like a younger brother gone, and none come to fill his place."

"Johnson always identified himself with the public work of his profession and community. He was for many years a member of the principal engineering societies, and especially active in the American Society of Mechanical Engineers, the Mining and Metallurgical Society of America, and the American Institute of Mining and Metallurgical Engineers, for which he enriched the literature of these societies on both sides of the Atlantic. His interests naturally brought him more closely into affiliation with the American Institute of Mining and Metallurgical Engineers, for which he served as a member of the board of directors and chairman and member of many prominent committees, including the vice-chairmanship of the iron and steel committee. Of recent years he has been active in guiding the policies of this institute, and at the time of his death was, besides a director, a member of the executive committee and chairman of the committee on admissions."

Export Association Indorses Hurley Plan

The American Manufacturers' Export Association, speaking for 1200 of the largest exporting manufacturers in the country, has adopted resolutions supporting the essential features of the plan recently advanced by Chairman Hurley of the Shipping Board for the private ownership and operation of American ships. Copies of the resolution to this effect adopted by the board of directors of the association are being sent out to individual members of Congress. On recommendation of the shipping committee of the association, consisting of E. M. Herr, president Westinghouse Electric & Mfg. Co.; W. C. Durant, president General Motors Co., and W. L. Saunders, chairman Ingersoll-Rand Co., the board of directors of the association has unanimously adopted the resolution which reads as follows:

"Resolved, that the board of directors of the American Manufacturers' Export Association indorses the general features of the plan advanced by Chairman Hurley of the Shipping Board for the operation of the ships now built and building by the United States Government, namely, the sale of these ships to private American operators at prices reflecting the current world market for similar tonnage, the fixation of maximum rates by the Government and provision for the reimbursement of private operators under certain conditions, and for a limited time, for losses sustained in handling business at competitive rates where the revenue is not sufficient to cover operating cost."

Chrome Industry in Danger

WASHINGTON, April 8.—The removal of import restrictions on chrome ore threatens the complete destruction of the domestic chrome industry, according to the United States Geological Survey. The admission of foreign ores without restraint, says a bulletin of the Survey, apparently leaves to the domestic producer only a limited local market in which he may successfully compete with imported ores.

"It is evident," concludes the bulletin, "that the imports have in large part destroyed the market for domestic ore."

Even during the war the embargoes on chromite imports from distant parts of the world, imposed to save ships, failed to keep the foreign product from our markets. According to the reports of the Bureau of Foreign and Domestic Commerce, the importation of Chromite in 1918 was more than 100,000 tons, nearly 28,000 tons more than in 1917.

The J. M. & L. A. Osborn Co., Cleveland, dealer in sheet metals, has acquired a site on Superior Avenue, adjoining the Pennsylvania Railroad, and will erect a two-story brick, steel and concrete warehouse. Plans are being prepared by the George S. Rider Co., engineer, Cleveland. The Osborn company has been in business in Cleveland since 1859, and is now located on the Superior Viaduct.

DISPOSING OF SURPLUS

Machine Tools Being Sold by Government— Agreement as to Spelter

WASHINGTON, April 8.—The War Department is still at work on the revision of contracts for the disposition of machine tools. It is now announced that the new agreements may be issued sometime this week. In the meantime, the office of the Director of Sales, through the District Manager of Finance, Air Service, Keenan Building, Pittsburgh, and the Material Disposal Section, Finance Division, Air Service, Washington, is offering machine tools in the hands of the Government at the plant of the Union Switch & Signal Co., Swissvale, Pa. These tools include eight boring mills, one breaching machine, 28 drill presses (multiple spindle, radial, etc.), one gear shaper, 95 grinders, one key-seater, 192 lathes (engine, turret, etc.), one measuring machine, 218 milling machines (vertical and horizontal, plain and universal), one planer, 10 power saws, one 30-ton press (forcing), 21 screw machines, two threading machines and 17 thread millers.

The Spelter Surplus

The Director of Sales of the War Department has held a conference with a committee representing the American Zinc Institute with regard to the disposition of the surplus stock of spelter. According to the announcement of the War Department, the figures of the surplus shown were considerably less than were anticipated by the representatives of the American Zinc Institute.

"Tentative arrangements were made," says the announcement, "whereby the War Department would dispose of its surplus through the zinc committee as representing the producers of zinc. The fact that the Government is arranging to dispose of its spelter surplus through the zinc committee will relieve any possible serious situation which might arise from the sale of this property by the Government itself."

The office of the Director of Sales is soliciting bids for 1825 net tons of open-hearth soft steel sheets, f.o.b. Youngstown. The sheets are 1 mm. x 38 in. x 52 in. The bids will be opened April 22.

The War Department is also offering for sale 41 10-12-hp. gasoline and kerosene engines. Six of these are at Norfolk, Va., 24 at South Kearney, N. J., and 11 at Savannah, Ga.

Ordnance Material Uncompleted

The War Department has issued the following statement of the value of the ordnance material still to be completed under contracts:

Artillery	\$55,839,486
Shell machining and forging, fuses, etc.....	17,705,453
Smokeless powder	21,405,000
Explosives, chemicals and loading.....	12,455,896
Trench warfare material.....	692,512
Automatic arms, small arms and ammunition.....	15,377,226
Tanks, tractors and trailers.....	10,059,566
Total.....	\$133,535,139

These entire amounts, says the statement of the department, would not be saved if remaining contracts were canceled, since part of the cost may already have been paid or obligated so as to constitute a valid settlement claim.

The Air Service of the War Department also issued the following summary of the values of its cancellations and suspensions of contracts through March 22:

Engines and spare parts.....	\$266,961,771
Airplanes and spare parts.....	165,288,590
Chemicals and chemical plants.....	18,648,239
Instruments and accessories.....	10,761,081
Balloons and supplies.....	10,071,035
Fabrics, lumber and metals.....	7,977,445
Miscellaneous	13,634,218
Total.....	\$493,342,379

The Altoona Iron Co., Altoona, Pa., manufacturer of bar iron, has been closed down because of lack of orders and the uncertainty of the outlook for the immediate future. Two hundred employees have been thrown out of work.

Wage Advances Still Being Granted

National War Labor Board Favors More Pay for Workers in Worcester Foundries—Brass and Iron Plants Put in Same Class—Other Decisions

WASHINGTON, April 8.—Brass foundries are placed on the same footing as iron foundries in a decision rendered by the National War Labor Board in the complaint of the molders and coremakers of Dayton, Ohio, against the Standard Miami Brass Co., Dayton Bronze Bearing Co., Demmick Brothers, Hoban Brass Foundry, Gem City Smelting & Brass Casting Co., Pasteur-Chamberland Co., Buckeye Iron & Brass Co., Advance Plants Nos. 1 and 2, American-Dayton Casting Co., of that city. The workers in these foundries asked for an 8-hr. day, with a wage rate of 75c. per hr. In its decision the board said that the iron foundries have made an agreement with the molders' union for an 8½-hr. day until May 1, 1919, and a basic 8-hr. day after that date, with a minimum rate of wages of \$5.60 per day, applicable to the present work day as well as to the reduced day after May 1, 1919.

"It is our belief," declares the decision, "that conditions agreed to as minimum standards for iron foundries should likewise apply to the brass foundries involved. It is, therefore, our decision that the agreement entered into March 3, 1919, governing the iron foundries, and as herein indicated, is affirmed, and we direct that the same conditions of employment shall apply to the brass foundries involved."

The board also ordered an increased compensation from \$5.25 a day to \$5.80 per day for the employees of the Pero Foundry Co., Coppus Engineering & Equipment Co., Standard Foundry Co., Rice, Barton & Fales Co., Blaisdell Machine Tool Co., L. W. Pond Machine & Foundry Co., Holyoke Machine Co., Star Foundry, Worcester Foundry Co., R. P. Power Foundry Co., Clinton Foundry Co., Worcester Polytechnic Institute, Well Chemical Bronze Co., Union Water Meter Co., Millbury Steel Foundry Co., all of Worcester, Mass.

In the case of the Pero Foundry Co., the only company which made a joint submission, the board ordered the increase made retroactive to Oct. 1, 1918. It also specifies that this wage shall continue to April 1, 1919, but does not indicate whether its effect was to terminate on that date.

Last fall the War Labor Board dropped proceedings in the case of the Providence Central Federated Union against the Rhode Island Branch National Metal Trades Association. In December, however, the case was renewed by the filing of similar complaints against the following companies:

American & British Mfg. Co., Brown & Sharpe Mfg. Co., New England Butt Co., Builders' Iron Foundry, Textile Finishing Machine Co., D. & W. Fuse Co., Franklin Machine Co., Colvin Foundry Co., Stillman White Foundry Co., Fuller Iron Works, Crompton & Knowles Loom Works, Allen Fire Department Supply Co., of Providence. R. I.; J. S. White Co., Fales & Jencks Machine Co., of Pawtucket, R. I.; Universal Winding Co., Hope Foundry Co., General Fire Extinguisher Co., Auburn, R. I.; L. Brayton Foundry Co., Riverpoint, R. I.

Only eight of these firms are members of the National Metal Trades Association. As the board had decided, before the filing of these complaints, that it would hear no more ex parte cases, its recommendation is limited to a statement of the right of the employees to bargain collectively, and an appeal to the employers to reinstate workers discharged for union activity.

The Bethlehem Controversy

In attempting to straighten out the three-cornered tangle between the employees, the Bethlehem Steel Corporation and the War Department, concerning increased wages ordered paid, the board recommended the following procedure:

1. That the secretary be authorized to appoint an administrator to proceed at once to Bethlehem.
2. That this administrator be authorized to interpret the award and rulings of examiners to the pay department of the Bethlehem Steel Corporation.
3. That the clerical forces of the pay department under these rulings work out the amount due each employee or former employee during the term of the award.
4. That these services be performed by the pay department of the Bethlehem Steel Corporation with the understanding that the clerical expense involved would become part of the amount to be paid to the Bethlehem Steel Corporation.
5. That after the pay department has worked out the amounts due each employee or former employee, this amount would be certified by the administrator and paid by the company.
6. That the company would render a statement for these amounts, addressed to the Ordnance Department, which statement should be presented to the administrator, who would approve it and transmit it to the Ordnance Department. The Ordnance Department would then make payment to the Bethlehem Steel Corporation to reimburse it for payments made under this procedure.
7. The period to which the award shall apply shall be determined by the secretary in consultation with Major Hawkins.

The board declined to order increased wages in the complaint made by the buffers and setters employed by Alexander Brothers of Philadelphia. The board declared that because the plant was shut down when the armistice was signed any increase ordered could only be retroactive. The board also refused a rehearing to the employees of the Worthington Pump & Machinery Corporation, and the Power & Mining Machinery Works, Cudahy, Wis.

It ordered an increase, however, of 10 per cent in the pay of the workers of the Matthews Engineering Co., Sandusky, Ohio, over the rate prevailing Aug. 20, 1918.

In the complaint of the Amalgamated Association of Iron, Steel and Tin Workers of North America, Local No. 78, against Bryden Horse Shoe Works of the Mfg. Iron & Steel Co., Catasauqua, Pa., the board ordered that every employee of the firm who worked from Oct. 15, 1918, until Jan. 1, 1919, or during any part of that period, shall receive an additional compensation equal to 10 per cent of the wages earned during that time. In the complaint of the Pollak Steel Co., Carthage, Cincinnati, the board ordered the establishment of the 8-hr. day.

Because no effort has been made to secure a direct adjustment of wages through the operation of workers' committees, the board denied a rehearing to the employees of the Youngstown Foundry Department against the United Engineering & Foundry Co.

At the plant of the Midwest Engine Co., Indianapolis, the board ordered the continuance of the present wages until a new scale can be adjusted through employees' committees. It also ordered the reinstatement of men who, it was charged, had been dismissed because of union activity.

The board recommended the continuance of the basic 8-hr. day, with four hours on Saturday, and a minimum wage of 75c. per hr. for journeymen pattern-makers in the plants of the Banner Pattern Co. and the Melvin Pattern Co., Columbus, Ohio.

Labor Notes

Henry Ford announces that the Ford Motor Co. in Highland Park, and the Henry Ford & Son plant, in Dearborn, are in a position to give employment to 1000 disabled Detroit and Highland Park soldiers in the manufacture of self-starters, magnetos and other small parts. The self-starter is being manufactured at the

rate of 2000 a day. In addition disabled soldiers will be used in the manufacture of magnetos at the Dearborn tractor plant of Henry Ford & Son. The men will receive the same \$6 minimum wage that is standard in the Ford plant.

The Goodyear Tire & Rubber Co., Akron, Ohio, will establish a Council of Industrial Relations giving a voice in the company's management to all employees over 18 years of age who have had six months' continuous service or one year total service in the factory. This council will meet with the factory manager and take up various factory problems. It will consist of five men named by the factory management, the manager and assistant manager of the labor department, two foremen to be elected by the factory foreman, and six non-salaried employees. The council will work out plans for a legislative body, members of which will be elected by employees entitled to vote.

The Hall-Scott Motor Co., Berkeley, Cal., announces that it has reopened its plant and that it will run on the "open-shop" principle. The company will institute a profit-sharing plan, whereby the men shall receive 25 per cent of the company's profits. The workmen will appoint a committee of five from their own body to confer with the management and to see that the men get fair play in the distribution of their share of the profits. B. C. Scott, president, says that the plant is to be enlarged, and that he expects that about 500 men will be employed after the completion of the new buildings which the company is about to erect.

According to data gathered by the United States Employment Bureau in East Chicago, Ind., and other manufacturing centers in the Calumet region, the intention of aliens to return to their former homes in Europe is widespread. About 20 per cent of 13,577 aliens in four industrial plants say they will return to their native lands. Officers in these plants say this means serious labor shortage if immigration is restricted.

The committee to whom it was referred has made a favorable report to the House of Representatives of the Connecticut Legislature on the bill providing that no female shall be employed in any manufacturing, mechanical or mercantile establishment between 10 p. m. and 6 a. m., except in war time.

A new wage scale announced at the Logan Iron & Steel Co., Burnham, Pa., reduces wages of practically all employees 30 per cent. Puddlers will receive \$3.50 per ton less. The recent reduction in the price of iron is responsible for the change.

The Warner Gear Co., Muncie, Ind., complains of a shortage of labor and, with 1100 employees, is advertising for 100 additional men. The company is anxious to employ soldiers but says few are applying.

Pennsylvania Railroad machinists at Altoona, under a new schedule which went into effect this week, are working 48 hours weekly instead of 40, as they had done for the past several months.

Blaw-Knox Co. Bonus Plans and Extensions

The Blaw-Knox Co., Pittsburgh, with works at Wheatland and Hoboken, Pa., has decided on a profit-sharing plan for the benefit of its employees to be put into effect at once. Every employee who has been with the company for one year or more will be given a bonus, the amount to be determined by the earnings of the company during the time the plan is in effect. It is not proposed to interfere in any way with the selling of stock to employees, which has been the custom of this company for some years, quite a number of the men, especially those holding responsible positions, having acquired holdings. All details of the bonus plan have not as yet been worked out, but it is believed that they will have the approval of the employees, and will further strengthen the good rela-

tions that have existed between this concern and its men.

The Blaw-Knox Co. has decided to triple the size of its plant at Hoboken. During the winter many thousands of cubic yards of dirt were removed to make room for new buildings, and other preliminary work was done. The main shop at present is 80 ft. x 800 ft., and it is proposed to add two new steel buildings of the same size. In one of these the forge shop will be located, and it will be greatly enlarged to meet growing needs. Considerable new equipment will be needed for these additions, but this will be purchased later. The concern is also giving serious thought to the housing problem for its employees, and has decided to erect 60 new houses, work on which will start as soon as possible. The company now has 45 houses, which are rented to employees at the nominal rates of \$12 to \$18 per month. The products of the Blaw-Knox Co. include steel forms for concrete construction, concrete mixers, clamshell buckets, transmission towers, steel mill buildings, the Knox equipment for open-hearth furnaces, also steel-plate construction.

Training Foremen at Taylor-Wharton Plant

The Taylor-Wharton Iron & Steel Co., Easton, Pa., has inaugurated a special course of training for its foremen in order to improve production and labor relations in its plant. A study group has been organized under John E. Calder, M. E., of the Business Training Corporation, New York, and W. M. Henderson, superintendent at the factory, to take up a course in modern production methods. Mr. Henderson is of the opinion that increased efficiency in the plant and more harmonious relations with employees depend ultimately on the foremen and that foremen trained in the principles of management and production, and having a broader vision of the company as a whole can get better results. An additional object is to develop competent understudies for the foremen among the more ambitious employees of the plant.

The foremen's class is studying such subjects as plant layout and routing; purchasing, stockkeeping and storekeeping; reduction of waste; production records; cost accounting; labor turnover; selection, training and supervision of employees; handling different classes of labor; discipline; safety and sanitation. The course consists of text books, problems and conferences, and lasts three months.

New Westinghouse Hours

Employees of the Westinghouse Electric & Mfg. Co., East Pittsburgh, effective from April 30, will work only 48 hr. per week instead of about 52 hr. as heretofore. The working schedule is made up of 43½ hr. for the first five days of the week and 4½ hr. for Saturday, a lunch period of 45 min. being given to all employees. All female labor in the plants will be dismissed at 4.15 p. m. each day, without loss of pay, in order that they may avoid the usual rush for street cars and trains, which occurs when the men and women leave work at the same time. These new working hours affect between 15,000 and 16,000 men and women, and are operative in all plants of the Westinghouse Electric & Mfg. Co., at East Pittsburgh. Since Feb. 1 the Westinghouse Air Brake Co., Wilmerding, Pa., and its subsidiary, the Union Switch & Signal Co., at Swissvale, Pa., have been working 48 hr. per week. All manufacturing plants in the Pittsburgh district, and this includes many steel plants, are getting down to the 48-hr. per week basis as fast as possible in order to cut out the time and half time wage rate for overtime.

Glasses for protecting the eyes from injurious radiations is the subject of technologic paper No. 93 of the Bureau of Standards, Washington, D. C. A record is given of experiments with different colored glasses for dealing with the infra-red, or so-called heat rays, the visible, and the ultra-violet rays. Twelve transmission curves and two tables are given. The information is of particular value to those working in the presence of electric arcs between iron, copper or carbon, and of furnaces.

FINANCIAL REPORTS

Cambria Steel Co. Shows Sharp Decrease in Income Compared with 1917

Net income of the Cambria Steel Co. for 1918 was \$7,567,535, which is less than one-third the corresponding figure for either 1917 or 1916. This equals 16.8 per cent on the outstanding stock, against 57.1 per cent in 1917 and 55.7 per cent in 1916. Expenses of operation, including repairs and maintenance, were about \$20,170,000 in 1918, compared with \$5,894,700 in 1917. These left a total net of \$16,691,462 for last year. The surplus at the year's end was \$2,167,535, contrasted with \$20,321,853 at the close of 1917.

Pittsburgh Rolls Corporation Report

The condensed balance sheet of the Pittsburgh Rolls Corporation, Pittsburgh, manufacturer of rolls for all purposes, which took over several years ago the roll business of the Seaman, Sleeth Co., is as follows for the year ended Dec. 31, 1918:

Assets	
Plant and property.....	\$1,384,554.83
Investment in securities.....	251,655.46
First mortgage bonds (deposited in sinking fund).....	66,000.00
Sinking fund cash balance.....	509.30
Inventories.....	444,703.72
Current assets—	
Cash.....	\$23,992.41
Special deposits.....	39,315.21
Accounts receivable.....	315,410.49
	378,718.11
Deferred charges.....	27,161.00
Good-will, patent rights, etc.....	1,279,747.51
Total.....	\$3,824,049.93
Liabilities	
Preferred capital stock.....	\$500,000.00
Common capital stock—	
Authorized.....	\$2,500,000.00
Less unissued.....	1,000,000.00
	1,500,000.00
First mortgage 6% gold bonds due	
July 1, 1932—	
Outstanding.....	\$934,000.00
Redeemed through sinking fund..	66,000.00
	1,000,000.00
Current liabilities.....	183,058.07
Accrued accounts.....	142,415.26
Advances received on export orders.....	24,800.00
Reserves.....	319,256.66
Profit and loss surplus.....	154,519.94
Total.....	\$3,824,049.93

National Acme Co. Expects Big Exports

The National Acme Co., maker of automatic screw machines and their products, reports profits for 1918, after deduction of all charges and taxes, of \$2,345,451, compared with \$3,664,301 of the year before. Considerable export business is expected, especially to England, France, Belgium and Scandinavia, with a limited amount to India, Australia, the Orient and South America. According to the president's report, "taken as a whole our foreign machinery business for the next three to five years should prove most satisfactory, both as to volume and profits. After more than two years of continuous building development, we have just about finished all the improvements contemplated for the time being."

Whitaker-Glessner Co. Annual Report

The annual meeting of stockholders of the Whitaker-Glessner Co. was held in its main office in Wheeling, W. Va., on April 3. Alexander Glass, chairman of the board, presented the annual statement of the company for the year 1918, which showed net profits, after making provisions for depreciation, special charges and Federal taxes, of \$2,271,215, from which dividends amounting to \$726,920 were paid, leaving a balance of \$1,544,295 to be carried to surplus. Officers of the company were re-elected as follows: Alexander Glass, chairman of the board; Andrew Glass, president; W. H. Abbott, A. C. Whitaker and E. C. Ewing, vice-presidents; W. H. Manning, treasurer; George T. Whitaker, assistant treasurer, and George W. Hocking,

secretary. Directors were also elected as follows: W. H. Abbott, Joseph Condon, E. C. Ewing, Andrew Glass, Alexander Glass, G. B. Glessner, Louis Gutman, D. H. Wagner, A. C. Whitaker, H. C. Whitaker.

Industrial Finances

Surplus, after charges and federal taxes, of the Remington Typewriter Co. were higher in 1918 than in any of the past four years, being \$1,918,470. The president's report states that improved shipping conditions have caused a considerable increase in business.

The American Smelting & Refining Co.'s gross business in 1918 was \$390,000,000, or \$50,000,000 less than the year before. Copper production in 1918 was 868,540,000 lb., against 916,974,000 the year previous, the high-water mark. The banking facilities of the company have been severely taxed by the dullness in the copper, lead and spelter markets.

Gross income of the Worthington Pump & Machinery Co. in 1918 was \$43,443,485, an increase over 1917, while net income was \$3,137,775, a decrease, the per share common stock earnings of the two years, 1918 and 1917, being \$16.37 and \$26.33, respectively. There was a decrease in 1918 of the reserve laid aside for the depreciation of investments, the figures being \$1,267,364 and \$1,500,000.

Gross sales, manufacturing profits and net profits of the United Alloy Steel Co. for 1918 were, respectively, \$40,055,862, \$4,511,427 and \$2,635,256. The first figure is greater by \$5,826,982 than for 1917, though the other two figures show falling off. Capital stock earned per share, \$5.01, against \$8.34 in 1917. Under the profit-sharing plan a deduction of \$284,242 was made. Federal taxes amounted to \$800,000, representing a decline of \$700,000.

The Willys-Overland Co. had ceased making automobiles when the armistice was signed and was running at 80 per cent capacity on airplane and engine parts, gun fittings, and other war material. By Jan. 31 the company was shipping 315 cars daily. Net profits, amounting to \$11,510,645 in 1918, were the largest in the company's history. The company wrote off \$1,317,800 for tool replacements and \$1,000,000 of book value of investments in other companies, chiefly in the Curtiss Aeroplane & Motor Corporation.

According to the annual report of the New York Shipbuilding Corporation there were completed in 1918 15 steamers, aggregating over 120,000 deadweight tons. All work was for the Government, the chief construction being on the newly completed super-dreadnought, Idaho. Surplus increased from \$1,791,449 in 1917 to \$1,919,807 the following year. Gross income for 1918 was \$2,624,647.

Gross earnings of the J. I. Case Threshing Machine Co. for 1918 were \$25,162,769, the highest in its history. In spite of heavy taxes the earnings on common stock were \$18.10, 4 cents less than in 1917. Bonded indebtedness has been reduced to \$3,206,000, which is one-third of the 1914 figure. Customers' borrowings have reduced to one-third of the 1915 amount, indicating increased prosperity of the farmers.

The directors of the Midvale Steel & Ordnance Co. have decided to reduce the dividend from \$6 to \$4 a share. Heavy investments in plant and inventory and the present uncertainties of the steel trade were causes for the action. The annual report showed a balance equal to \$14.60 per share earned in 1918. Cash holdings at the year's end amounted to \$12,000,000.

The Kelsey Wheel Co.'s report for 1918 indicates net profits after charges and Federal taxes of \$776,778, against \$1,040,255 of the preceding year. Surplus is \$572,028, about two-thirds that of 1917.

The Carpenter Steel Co., Reading, Pa., announces the removal of its Chicago office to 1101 West Lake Street, where a new branch warehouse has been opened. John B. Guthrie is the district sales manager in charge.

Many Hindrances to Foreign Commerce

WASHINGTON, April 8.—The export situation for American industry is being complicated by a continual change in the restrictions imposed upon commerce both here and abroad. Ambassador Davis has cabled from London that the British Government has relaxed its export restrictions to permit the unrestricted exportation to the United States and certain other foreign countries of boilers and their component parts, other than iron and steel plates, fuel economizers constructed of cast iron, pipes used as auxiliary heating apparatus in connection with land or marine steam boilers, cast-iron guttering and cast-iron gutter fittings and connections, lead-coated sheets, cast-iron pipes and cast-iron pipe fittings and connections, radiators manufactured of cast-iron pipes, terne plates, tin plates, and the following railway material of iron or steel: Sleepers, springs, wheels, axles and tires, and other railway construction material except rails, railway carriages, locomotives and wagons and their component parts.

From Stockholm, Sweden, Trade Commissioner Anderson has cabled as follows:

"In view of the fact that Sweden is receiving from America a large amount of food and other necessities, and selling only a small amount in return, there is available for return cargo to America a large percentage of tonnage. If at present offerings the United States purchases at unfavorable rate of exchange, a sufficient quantity of Swedish pulp, pig iron and steel can be supplied to cover all the available returns of cargo space to the United States."

To avoid embarrassing difficulties that might hamper shipments to countries contiguous to Germany, the War Trade Board has issued the following announcement:

"Instances have recently come to the attention of the War Trade Board wherein certain American exporters have been embarrassed by reason of the fact that they have entered into definite commitments for export shipments prior to the receipt of the necessary export licenses. The War Trade Board takes this opportunity to renew its warnings to exporters that although the importer in the country of destination may have contracted to purchase goods, and may have cabled that he possesses the necessary import certificate, the prohibitions of the trading-with-the-enemy act and the necessity of maintaining the blockade conditions may prevent the issuance of an export license.

"In view of the present policy of the associated Governments with respect to shipments to the countries contiguous to Germany, the War Trade Board is unable definitely to assure exporters in advance that licenses will be granted. For their own protection, therefore, exporters should obtain export licenses before making definite and unconditional commitments."

Transport difficulties are hampering iron and steel imports from the United States, by Switzerland, according to a report made by J. C. McNally, acting Consul General at Zurich. He says an association has been formed there for the purpose of buying iron from the United States, but transportation obstacles have interfered with carrying out the project.

German Spiegeleisen and Ferrosilicon Prices

The prices of certain manganese-iron alloys, and of ferrosilicon in Germany are revealed by the following statement in a recent issue of the *London Iron and Coal Trades Review*, based on translations from German papers:

Ferromanganese, 20 per cent, which was formerly 390 marks (\$92.80 at par), is now 570 marks (\$135.70), and the price of the 30 per cent alloy has been advanced from 570 to 730 marks (\$135.70 to \$173.70). The price of ferrosilicon, with 9 to 14 per cent silicon content, formerly 296.50 marks, is now 390 marks (\$92.80) for lots of less than 10 tons, the prices diminishing for larger consignments down to 375 marks for 50-ton lots and upward as compared with 281.50 marks formerly in effect.

PAINT ROCK

Experiments Which May Have Important Results on the Ore Market

Under the auspices of the State Superintendent of Mines for Minnesota an experiment is being conducted in the manipulation of the paint rock that is so prominent a feature in many Mesaba range mines. This experiment has been carried out in connection with an investigation of the peats of the northern part of Minnesota. Some very interesting results have been attained.

Specifically, this experiment has been on ores from two State owned mines of the central Mesaba, one of which contains some 65,000,000 tons of merchantable ore, the other some 16,000,000 tons; the two have strata of paint rock in the ore estimated at somewhere in the neighborhood of 20,000,000 tons. If this paint rock can be made merchantable there will be an addition of not far from 10 per cent in salable tonnage, after eliminating moisture and after loss on ignition. Paint rock ordinarily runs from 30 to 35 per cent iron and from 20 to 40 per cent moisture, etc. The experiments on ores of these two mines have shown a resultant ore assaying from 50 to 52 per cent iron natural assay, and from 10 to 15 per cent combined silica and alumina, and non-Bessemer. They show from 1.0 to 1.5 manganese. The product is a briquet, calcined, without dust or moisture, and is not an unfavorable furnace material. The iron is about equal to that of the average non-Bessemer Mesaba shipment of the past few years.

The process is simple; paint rock is worked in a pug mill with a certain proportion of peat, say about 5 per cent, and is then passed through a briquetting machine, and burned as a brick, the heat required for starting the burning being derived from additional peat. The experiment shows a considerable byproduct in the way of sulphate of ammonia, etc., from the peat.

Minnesota contains vast quantities of peat, most of it in the region of the mines, and it has been the desire of State officials that something be done with this material; primarily this desire was merely the production of a fuel for local consumption, to relieve the coal situation, but this experiment seems to show that there is a possibility of something more profitable and important. The scheme includes, also, the production of power on a considerable scale, to be sold for mining purposes. But the sulphate of ammonia byproduct is expected to carry the project and to furnish the greater part of the profit hoped for from the enterprise.

No one can say what tonnage of paint rock there may be on the Mesaba range; it is vast. Most mines of that portion of the range not in the washable western area carry at least one heavy stratum of it, and there are great quantities in lands not mined and not valuable at present for their merchantable ores. If the percentage that is estimated in the two mines examined and estimated upon is continued for that part of the range in which it forms a considerable portion of the ore formation, it is probable that there is enough to make a total of at least 100,000,000 tons of product, if this experiment be found feasible and profitable. That there is plenty of peat for the manipulation of such a tonnage is unquestioned—indeed, the quantity of available peat in Minnesota is estimated well beyond five billions of tons.

This experiment is interesting and will be watched with considerable interest, not only from what it may do for the Mesaba paint rocks, but for what it may also do for some of the Cuyuna range manganese ores. Preliminary results seem to show that a product can be made that will run say 46 to 47 per cent iron and about 5 per cent manganese, in the form of a briquet.

Mining engineers predict that the time will come when many of the finely comminuted ores of the Mesaba, now troublesome on account of their excessive dust, will be agglomerated; whether this will be done with peat or by other fuels, remains to be seen, but the peat is to be had and is cheap.

AMERICANIZING EMPLOYEES

Features of an Effective Campaign in Connecticut

HARTFORD, CONN., April 5.—In the Americanization movement, Connecticut has furnished several striking examples of co-operating agencies laboring energetically for its promotion. Among these are the State Chamber of Commerce, the State Manufacturers' Association, and the State Federation of Labor, these being backed up by the Aetna Life Insurance Co., Travelers Insurance Co., Connecticut General Insurance Co. and the Hartford Fire Insurance Co. The insurance companies agree to consider the adoption of the proposed policies and the manufacturers' efforts for the Americanization of a plant as a factor in the reduction of the insurance hazard.

Where the one language is not universally understood there is obvious danger for everybody. The situation would be comparable to that prevailing in a plant where the employees were deficient in hearing and speech. At once deaf and dumb, or nearly so, there is every probability of instructions being misinterpreted and of accidents resulting. So it is with non-English speaking employees in the United States.

The Connecticut Plan

This plan, as is pointed out by President E. Kent Hubbard of the Manufacturers' Association of Connecticut, assumes that employers will take only such action as is suited to the needs and conditions existing in the individual plants, the policies submitted being merely intended as suggestions. These policies were jointly considered by the Americanization Department of the Connecticut Council of Defense and the Committee on Education of the Manufacturers' Association. It was agreed that the adoption of wise policies by those employing the thousands of foreign-born workers in Connecticut would be a powerful factor in the education of these men and women for greater efficiency in their work and in their preparation for citizenship.

The State Department's purpose is "to bring economic pressure to bear upon our non-English speaking population for the purpose of getting them to learn English, attend night school and study about the American Government. Publicity through the medium of posters, hand bills, pay envelope slips, and other forms in foreign languages has been tried by this department, the school authorities and local communities with only limited success. To be sure of steady night school attendance, and to really make an impression upon the foreign mind as to the necessity and value of learning English, it is necessary to bring economic pressure to bear upon him; that is, to let him understand that it affects his pay in some way."

The State Department of Americanization holds that citizenship is a high privilege in itself, and that the principle of economic pressure is used to impress this fact and to promote the use of a common tongue rather than to force the unwilling to become applicants for naturalization. The chief pressure is upon learning the language of this country and an acquaintance with the rights as well as the obligations of an American. The department assumes that ability will be given first recognition by an employer and it asks that employers of foreign-born labor adopt the following policies as fundamental in the administration and management of their plants.

Shop Policies

1. All other factors being equal, give preference in hiring to English-speaking applicants or to applicants who are studying English in a night school or in some other effective way over the non-English-speaking applicant for a position.
2. All other factors being equal, give preference in promotion to the employee making himself more efficient by learning English, either by attending night school or in some other effective way, and all other factors being equal, give preference in promotion to the efficient English-speaking employee of foreign birth who speaks English well as against the non-English-speaking employee who is making no effort to acquire English.
3. Recognize increased efficiency on the part of the for-

ign-born employee who is studying English. Some employers have done this by a wage increase, wage bonus, prize, medal, or other work of estimation.

4. When it is necessary to reduce a working force, as between two men equally efficient, working under equal conditions, adopt the policy of laying off the non-English-speaking alien, retaining the English-speaking employee or employee making himself more efficient by studying English in the night school or in some other effective way.

5. Make English the language of plant administration, exceptions to be tolerated only in case of absolute necessity. This can be done by printing in English safety signs, signs of warning, and rules and regulations. All foremen and superintendents should be able to speak English. Instructions regarding work, machinery, etc., should wherever possible be given by foremen and superintendents in the English language.

6. Adopt the policy, where good night schools have been established, of checking up attendance to night school or factory classes in co-operation with the school authorities, so that, upon receiving due notice from the school authorities or teachers that a given employee has failed to attend regularly, a superintendent or foreman will notify such employee that the plant desires the employee to learn the English language, and, having enrolled in a night school or other facility for education to keep up a regular attendance, and that his failure to do so will have a distinct bearing upon his opportunity for advancement by the employer.

7. If night schools are not available, co-operate with public school authorities and others in organizing classes in English and citizenship for foreign-born employees either in the public schools or in the plant, or in some other convenient location.

Second Meeting of the Electric Furnace Association

The second meeting of the newly organized Electric Furnace Association, described in THE IRON AGE of March 27, was held at the Chemists' Club, 50 East Forty-first Street, New York, on the afternoon of April 3. A constitution and by-laws were adopted tentatively, dues were fixed and a membership committee was appointed to push a campaign for new members among manufacturers, dealers, and users of electric furnaces and all others interested. There was an attendance of 35. The following committee chairmen gave reports: C. H. Booth, Booth-Hall Co., Chicago; W. E. Moore, Pittsburgh Electric Furnace Co., Pittsburgh; C. G. Schluederberg, Westinghouse Electric Mfg. Co., Pittsburgh, and F. P. Snyder.

Export Association to Give Luncheon in Chicago

Following the custom set last year in Cincinnati, the American Manufacturers' Export Association will tender a luncheon to all members who may be in attendance at the National Foreign Trade Convention in Chicago, April 24-26. The luncheon will be held in the Congress Hotel at 12:30 p.m. on Friday, April 25, and will precede the group session on "Direct Selling" which begins at 12:30 p.m. in the same hotel under the association's auspices. The speakers will be Alba Johnson, president Baldwin Locomotive Works; E. M. Herr, president Westinghouse Electric & Mfg. Co.; C. E. Jennings, president C. E. Jennings Co.; W. B. Campbell, president Perkins, Campbell Co., and George Ed. Smith, president Royal Typewriter Co., all former presidents of the association.

Coke Producers Confer

UNIONTOWN, PA., April 7.—A series of conferences between leading members of The Fayette County Coke Producers' Association now in progress promises to have a most important bearing upon the future of the Connellsville region. Revived at a meeting a week ago at which 35 operators were present, the association has been wrought into the most effective organization in its history and participating in the conferences now in progress are the leading independent producers and operators in the region. The firm determination to keep the output strictly within the demand, to oppose any paring of wages and to prevent a price that will make an equitable margin of profit impossible is being strengthened at every turn.

CORRESPONDENCE

Government's Failure to Pay Holds Up Business

To the Editor: On page 906 of the issue of April 3, under the heading "Buying Is Limited," your first two paragraphs "hit the nail on the head." Just what was in the minds of the "powers that be" who journeyed to Washington with a view of bettering conditions by reducing the price on iron and steel I do not know, but evidently they simply shut their eyes to the actual conditions existing in the general manufacturing business or were unknowingly "barking up the wrong tree," which is hard to believe of such wise heads.

The present stagnation in most businesses is primarily caused by the failure of our Government to pay promptly its obligations. It has been acknowledged by the Government, including the Army and Navy Departments, that at the present time there are over \$2,500,000,000 in orders held up or canceled and the accounts still unpaid or unadjusted, nearly five months after the signing of the armistice. Many of these orders have been partly completed, all or part of the material purchased and in manufacturers' warehouses, or in some stage of completion and paid for. The labor performed on them until the time of their being held up had been paid in weekly wages, salaries and overhead and similar expenses, and at the present time this money is tied up and the capital of each manufacturer or contractor reduced to this extent, in some cases as high as 50 per cent of the capital.

It is impossible for these people to go ahead with other business, purchase new materials, and proceed with their regular or new lines until this money has been returned to them either in full or in part.

At no time in history has such an enormous sum of money been owing by one Government to creditors for work suspended or canceled for which settlement has been delayed for so long a time. I do not believe, in spite of the fact that this country is to-day the richest in the world, we shall see any substantial improvement in business until these obligations by our Government are liquidated. After this has been accomplished the iron and steel business and all others will adjust themselves to their proper level according to the old and fundamental law of supply and demand.

AN "IRON AGE" READER.

Philadelphia, April 4.

Machine Tool Prices as Affected by Continued War Taxation

To the Editor: With reference to the agitation now going on for lower prices, I would like to call your attention to a subject which to my mind is a fundamental reason why prices should not be materially reduced. Let me point out to you that in the pre-war period the United States had only to raise about one billion dollars to pay the entire expenses of running the United States Government, paying all of its bills. We are now facing a problem of raising at least four billion dollars per year, which is four times as much as was required during the pre-war period.

I believe it makes no difference how or in what manner the United States Government goes about to raise this yearly tax of four billion dollars; but in order that this money may be raised it must be added to everything that is bought or sold in the United States, including wages and salaries. Our present method of taxation collects money from the wage earner, the salaried worker, the manufacturer and the agriculturist. Now, bear in mind that unless all of the above mentioned sources of revenue are making money there is nothing to be taxed, and if our present methods of taxation fail to collect sufficient revenue it means that other methods will be adopted that will collect sufficient revenue.

It might take the form of high tariffs on imports and a tax on all sales, but these methods, if adopted,

would automatically increase the price of everything so taxed, and there is no possibility of escaping a yearly tax of four billion dollars for several years to come, which must be reflected in the price of all things.

Some manufacturers content themselves with the idea that if their profits are small their taxes will be small, and thereby lose sight of the fact that the Government is going to raise this tax, whether by the present methods or some others that might be devised.

I wish to repeat, so that the main point of my contention will not be overlooked, i. e., that the United States Government is going to raise by taxation four billion dollars per year for some years to come.

I do not wish to be understood as defending prices that have been increased 300 to 400 per cent over pre-war prices, but I wish to point out that machine-tool prices from 1912 to 1914 were at least double the prices in effect during 1901 and 1902, notwithstanding the fact that we had during that period passed through a most wonderful development in methods and facilities of production, including the adoption of high-speed steel for cutting tools, and production methods, including great strides in the art of jiggling and tooling, as well as new incentive systems, all of which tended to increase production far beyond the increases that were made in the size and complication of construction in machine tools. Yet, notwithstanding the fact that prices were doubled during the period above mentioned, the prices in 1914 were not high enough to pay the manufacturer anything like a fair rate on his investment.

I believe practically all of the above mentioned facts are disregarded or forgotten by those who are talking of a reduction in the prices of machine tools.

A. E. NEWTON,

President National Machine Tool Builders' Association.
Worcester, Mass., April 4.

No Mystery in Russian Sheet Iron

To the Editor: I am very sorry that I did not notice a letter of Mr. Griffith E. Davies in your paper of the Feb. 6 issue. I am a Russian metallurgical engineer, and was working for the Russian iron industry more than ten years. In the period of 1913-1915 I was a manager of the Alapaevsky Mining Works (Ural Mountains), where there were three blast furnaces, three open-hearth furnaces and eight rolling mills producing the so-called Russian sheet iron.

Mr. Thomas D. Wood (THE IRON AGE, March 20) is absolutely right telling that there is no mystery in our sheet iron and he is right, too, when he is giving the reason why the Russian iron is much better than most other sheet irons. We Russians never used the convict labor and in the year 1913 the workmen's wages were the following: Roller, \$1 for the 6-hr. shift; his first assistant, 75c.; his second assistants, 50c.

Owing to the fact that the cost of living in Russia before the war was very low (one-sixth of what it is now in the United States) I consider the above-mentioned wages were very liberal. About 80 per cent of all Ural Mountains workmen had land and in summer time it was rather impossible to run not only the rolling mills but even the blast furnaces, and we executives and foremen were really a "convict labor," and our workmen were the "real free men."

American people have always had a wrong impression in connection with the conditions prevailing in our country, and even now in the most critical time of the Russian state, America, in my opinion, is mistaken in thinking that a peace is possible between the Russian people and the Bolsheviks, who by correct expression of Lenin (head of the so-called Bolshevik Government) have for every one real Bolshevik 39 crooks and 60 fools.

V. J. GUDKOV,

Metallurgical Engineer.

Nathan M. Kaufman, Myron B. Ozersky, and others, have incorporated the Liberty Iron & Metal Co., Youngstown, Ohio, which will conduct a business in scrap iron and other metals.

ESTABLISHED 1855

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British and American Steel Prices

The British steel trade is disturbed over the possibilities of American competition. Some time ago the London Board of Trade sent out a message to the effect that the United States "is able to sell steel all over the world £5 cheaper than we in this country can do," and British steel manufacturers were asked for an explanation. Thereupon the same question was asked in the House of Commons, in view of the fixing by the Ministry of Munitions of the prices at which exporters there sell British steel to foreign consumers. The latest form of the inquiry that is going the rounds in Great Britain is: What effect will the discontinuance of the British Government's war subsidy to the iron and steel manufacturers on April 30 have on the competitive standing of British steel in the markets of the world?

The London Board of Trade was not right in saying that American steel could undersell British steel by £5 per ton. American steel manufacturers would be wasting profits to make any such cut as that, even if they could, and would be looked upon as poor salesmen. On ship, bridge and tank plates, for example, the British export prices have been about \$77 per gross ton, or about 3.40 cents per pound, and structural material \$75 per gross ton, whereas the reduced price on plates in the United States is 2.65 cents per pound, and on structural material 2.45 cents per pound. The difference on plates between the two countries is \$16.80 per gross ton, or only two-thirds as much as the spread reported by the Board of Trade. Moreover, there is a shipping handicap on American steel which would tend somewhat to close the gap between steel prices as quoted in the two markets.

London papers, indeed, have pointed out that some American quotations are not nearly as much as £5 below British export prices. In India, for example, American manufacturers have been quoting £2 under British prices. Nevertheless, the difference is sufficient to cause serious inquiry and discussion.

The anxiety of British steel manufacturers over the competitive situation is indicated in the statement submitted by the National Federation of Iron and Steel Manufacturers to the British commission which has been investigating the effect of the recent demands of coal miners for advance in wages and shortening of hours. As stated in THE IRON

AGE of last week, the manufacturers showed that when the British subsidy is removed they would be paying for blast-furnace coke over 39 shillings per ton at ovens, as against 18 shillings paid for coke by blast furnaces in the United States. The disparity is really greater, as Connellsville coke can now be had at \$4 and less. British steel manufacturers also represent that every shilling advance in the cost of coal would mean 4 shillings increase in the cost of finished steel. Thus it is plain that the proposed concessions to the coal miners of Great Britain will mean a further handicap to British steel manufacturers in competing with American steel. British steelmaking costs have increased heavily, and only actual market transactions will show what the competitive situation is after the discontinuance of the Government subsidies on April 30. Late cable advices to THE IRON AGE are that fully 50 shillings advance is expected in steel prices to the domestic trade in Great Britain after the removal of the subsidies. This would bring domestic prices there, as shown in detail in our London market elsewhere in this issue, practically up to the level of export prices. In that case, if vessel room could be had at freights ranging from, say, \$15 to \$20 per ton, considerable American steel could be sent into Great Britain. Even on the situation of to-day there is little risk in the prediction that large contracts for American sheet bars will soon be placed here by British sheet mills.

British-American Trade Alliances

International commercial alliances, with the business interests of the United States as partners, could be easily consummated if surface conditions are any guide. This seems to be particularly true in Great Britain. American sojourners there seem all to bring back the impression that a great desire for co-operation with America in exporting is everywhere the undercurrent of discussion and that through some understandings, however they may be arrived at, severe competition could and should be avoided. Few have worked out any specific program. A practical plan like the old-time partitioning of the world for rail purchases is as yet not even offered as a suggestion. The noteworthy fact remains that the

American business man who comes in contact with the atmosphere abroad where the sacrifices of war are a tempering influence returns charged with something of the same idealism. One cannot help wondering how much of this attitude would be in evidence if there were brisk world buying and less time were left for speculation.

The Price-Fixing Fiasco

That the movement to start business and reduce unemployment has been seriously hurt by the performances at Washington in the past week admits of no doubt. Price stabilizing, for which so much was claimed in advance, looks very much like a fiasco. The plan under which the Industrial Board, under the President's authorization, was to summon industry to Washington, group by group, was put forward officially as the successor to Government control through the War Industries Board. The country was told that "co-operation and agreement in industry at Government instance, and with Government approval, is necessary to bring the law of supply and demand back into normal operation and let loose prosperity."

A voluntary lowering of prices was called for, under Government sanction, such a reduction "as will bring the buying power of the Government itself, including the railroads, telephones and telegraphs, into action and make it possible for the Government to state that it is willing to be a buyer for its needs at the reduced prices." The steel industry, as basic and representative, was appealed to first, and the response was a promise to co-operate to the fullest possible extent. Individual opinions were put aside and a lowered schedule of prices was agreed upon at a conference with the Industrial Board. Scarcely two weeks had passed when the Railroad Administration refused to accept the new prices, contending that it "could obtain substantially lower prices through its own initiative," and that the anti-trust act forbids such a plan of price fixing.

Various explanations are given, tending to exculpate this or that department or individual, but it is hard to escape the conclusion that the steel manufacturers have treated the Government with more fairness than the Government has shown them. On Government buying at the prices agreed upon the whole success of the plan turned. The manufacturers gave their co-operation, they made concessions which were accepted by the Government's representatives, and now Government buying at these prices is refused. What sort of a Government is this? What sort of Government representatives are these?

The repeated conferences between Government officials in the past week have come to nothing. It is evident that last year's dispute over coal prices and its sequel are figuring in the contest over steel prices, and that the steel schedule is not being treated on its merits. The steel manufacturers have made concessions. Few of them could go further with these without touching labor; but even were the level lower, the Railroad Administration has declared against all price fixing on the Redfield plan.

The alternative is the old-time readjustment, in which profits and wages are sacrificed, and from

which all semblance of stabilization is wanting. If that is the sort of readjustment the Railroad Administration wants, it has taken the precise course that will bring it about. But closing down steel works will not improve the Administration's railroad balance sheets, now chiefly written in red, nor will it furnish profits to meet the war tax levies of the coming year. So far as the steel industry is concerned, at no time since the armistice began has its rate of operations been less or the uncertainties as to the immediate future greater.

Electric Furnace and Iron Castings

A new use has been found for the electric furnace. It consists in duplexing with the cupola. On other pages of this issue remarkable results are shown in making high grade cast-iron by this new process. It may be termed "duplex iron" as contrasted with duplex steel. By superheating cupola iron in an arc electric furnace, gray-iron castings of unusual properties have been produced commercially. The changes in the metal are striking, when it is considered that the iron is kept under electric conditions less than a half hour. Besides the greater fluidity and a certain amount of refining, especially as to sulphur, the density of the metal has been increased, the structure changed and the strength augmented 75 to 90 per cent.

While the author claims only a limited use for this dual process, it is probable that duplexing with the cupola will open up a wide field. Dr. Richard Moldenke, in discussing the paper, pointed out that this process affords a solution of the sulphur problem in cast-iron scrap that has been vexing foundrymen for many months, especially since the war started. Not only can iron castings possessing nearly all the desirable physical properties be produced—combining in one iron the good qualities obtainable only separately by different grades—but there is also opened up the probability of producing metal of semi-steel grade, also malleable castings superior to any now made. In fact the Cincinnati company which now makes public its results in gray iron has accomplished just these things.

There is also at once suggested the possibility that these unusual results may be obtained by the electric furnace alone, starting with cold metal. Even at a slightly higher cost, the higher grade product possible may warrant such a departure. An article in THE IRON AGE of Aug. 30, 1917, described the production of low phosphorus pig iron from steel scrap, iron castings of unusual properties being made at the same time. Later tests of this metal, published in THE IRON AGE, June 20, 1918, revealed its pronounced strength as compared with cupola castings. Only war conditions warranted the production of such metal from an economic standpoint.

In this connection it is of value to note that a large American cast-iron pipe maker is considering the installation of an electric furnace in which to keep hot the molten blast-furnace metal it secures from another company. There is also under way the super-heating and refining of blast-

furnace iron in electric furnaces before the metal is introduced into centrifugal machines for making centrifugally cast-iron pipe of various dimensions.

More agitated than ever are projects for harnessing the many water powers of the country and transforming them into electric energy. There are those who expect that electric power will be made abundant and cheaper by this means. Should this materialize, it will render the use of the electric furnace more widespread and result in the greater use of triplexing or duplexing with the open-hearth or the cupola and the realization of surprising metallurgical results and products.

Taxes for 1919

The belated enactment of the revenue law, when the 1918 profits that were to be taxed had already been earned—and to a large extent spent—focused attention on the tax provisions for 1918, and the provisions relating to taxes upon profits made in 1919 and later received little study. It is possible now to devote more attention to the provisions for taxing the profits of this and following years. The corporation tax, the regular income tax upon corporations, 12 per cent for 1918, becomes 10 per cent for 1919. The "war profits and excess profits tax," the alternative tax of which the 80 per cent alternative proved the more common, becomes a tax of 20 per cent upon profits above 8 per cent, and not above 20 per cent of invested capital, there being a 40 per cent tax upon profits beyond that limit.

The largeness of the reduction in taxes from 1918 to 1919 may be observed by considering an interesting example, that of the United States Steel Corporation. From the 1918 profits recently reported the corporation made deductions for Federal taxes of \$274,277,835.

It is not known what allowance for invested capital is now accorded the Steel Corporation, but it is generally assumed that the Steel Corporation was meant when Secretary McAdoo testified, on Aug. 14, 1918, before the Ways and Means Committee, that there was a corporation which paid certain taxes for 1917 and had an invested capital for the year of \$1,427,233,403. The amount was slightly in excess of the Steel Corporation's book value. If this item has increased, the corporation's exemption would be increased, so that the conservative computation for 1919 is to take this same figure.

As noted in the brief analysis of the Steel Corporation's 1918 report in this department of THE IRON AGE a week ago, the profits in 1918 were about \$550,000,000. To take a specific figure, one may assume profits in 1919 one-half as great, or \$275,000,000, this amount being still largely in excess of profits in any year before the war. The corporation's exemption, for computing the 20 per cent tax, would be 8 per cent on \$1,427,233,403, or \$115,000,000, so that the 20 per cent tax would fall upon \$160,000,000 of profits and would therefore amount to \$32,000,000. For computing the 10 per cent income tax this \$32,000,000 would be deducted from the total profits of \$275,000,000,

leaving \$243,000,000 subject to the 10 per cent tax, which accordingly would amount to \$24,300,000, and the total tax would be \$56,300,000. There are one or two minor points not here considered, but they are quite negligible for the purpose of this comparison. The \$56,300,000 for 1919 would compare with \$274,277,835, showing a decrease of \$218,000,000, which on an output the same as that of 1918 would be about \$16 a ton.

The profits remaining would be \$218,700,000 available for payment of subsidiary company bond interest and regular charges of the Steel Corporation, this comparing with \$208,281,104 as the corresponding item for 1918.

It will be observed that a reduction of \$218,000,000 in taxes does not explain how profits could decline from 1918 to 1919 by \$275,000,000 and yet leave increased net earnings. The corporation had to use \$61,000,000 of its 1918 profits for two special purposes—to write off \$40,000,000 from cost of plant facilities installed in connection with the war and having only a salvage value at the end of the year, and to write off \$21,000,000 from inventory. These amounts, of course, will not need to be written off again.

Engineering Society Consolidation

Consolidation of engineering societies was spoken of quite frankly at a union meeting in New York on March 26. A gathering of members of eighteen organizations had been arranged to discuss co-operation and co-ordination under the topic "The Engineer as a Citizen." Not a very large turnout answered the summons, due it is believed to a somewhat colorless announcement, but not a dissenting voice was heard to propositions calling for co-operation or consolidation in one form or another. THE IRON AGE has noted from time to time the increasing desire for amalgamation and apparently the movement has gained considerable momentum. The class who through united effort hope to gain broad public recognition for the engineer as a professional man, qualified to speak with authority on public questions involving engineering, is gaining the ascendancy over the class who look individually upon their societies as conferring some specific honor. The larger number, if such it is, think less of the varying requirements among societies and among grades of members than that the public will look upon all as engineers, just as this same public does not differentiate among physicians or lawyers. These professions are not narrowly organized according to specialists, though individually their fields of practice may be wide apart. If the meeting does anything it ought to spur on the movement now under way in a few of the leading societies to study the aims of the organizations in the light of present-day conditions.

A pamphlet has been issued giving a pictorial description of the college of engineering and the Engineering Experiment Station of the University of Illinois at Urbana. The experiment station has issued 110 bulletins on special research work. The pamphlet shows nearly 100 views of laboratories, buildings, machines, testing apparatus, and productions of students.

Trade Union College at Boston

The Trade Union College at Boston, heralded as an institution "to make directly accessible to working men and working women the study of subjects which will further the progress of organized labor," was opened on April 7. It was organized by the Boston Central Labor Union, and its sessions are to be conducted in the High School of Practical Arts. The undertaking provides for a series of lecture courses, with periods for study and discussion. These are open to trade unionists of the American Federation of Labor and their immediate families for a sum of \$2.50 for each course of instruction. The latter comprise for the spring term English, labor organization, law, government, economics and physics. Ten lectures will be given in each course, and they will continue for ten weeks. A larger program is being planned for the fall term.

The management is in the hands mainly of representatives of the various local unions, but the list of lecturers includes a number of men of national repute. Among them are Roscoe Pound, dean of the Harvard Law School; Irving Fisher, professor of political economy, Yale University; Felix Frankfurter, formerly chairman of the War Labor Policies Board; Francis Bowes Sayre, lecturer on constitutional and international law, Harvard University; and Arthur Fisher, formerly of the Industrial Relations Division, United States Shipping Board.

Conserving Manganese in Manganese Steel Scrap

A method of using over again manganese steel scrap without great loss of manganese by oxidation or volatilization is reported by a patent (U. S. 1,291,655 and 6) granted to W. G. Nichols, Chicago, and assigned to the American Manganese Steel Co. Cold scrap, with or without additional 80 per cent ferromanganese, is charged into an electric furnace and heated carefully to about 600 deg. Fahr., and maintained at that temperature until the non-conductive metal has a thoroughly equalized heat. The temperature is gradually raised, without the production of hot spots, until the whole is at 1200 deg. Fahr., when a basic slag is added and a reducing atmosphere maintained so as to prevent loss in manganese. Gradually the temperature is raised to the fusion point of the steel, and is kept without superheating until a short time before tapping. Such an alloy can be made into castings, or used as an addition to converter metal; in the latter case it is recommended that the highly heated blown metal be tapped, the slag skimmed off, the melt weighed, and a computed amount of molten manganese-iron alloy added, the latter formed as above and at a minimum pouring temperature. The resulting temperature of the mixture should then be such as to allow immediate teeming.

War Material Undelivered

WASHINGTON, April 8.—(By Wire).—The Ordnance Department still has \$122,000,000 worth of material to be delivered on war orders. When the armistice was signed, the total outstanding was \$3,500,000,000, now reduced by deliveries and cancellations. The balance on order for the purchase, storage and traffic division has dropped from \$1,000,000,000 to approximately \$300,000,000. The air service has cleaned up practically all of its \$500,000,000 worth of orders.

Submarine Boat Corporation Offer

WASHINGTON, April 8.—(By Wire).—The U. S. Shipping Board to-night made public an offer from the Submarine Boat Corporation of Newark, N. J., to build 12,000 deadweight ton cargo steamers at \$149 per deadweight ton on an order for eight ships at a time without any Government guarantee on labor or materials. The board has taken the bid under advisement, Chairman Hurley declaring it a low figure in comparison with other prices mentioned from \$185 to \$225 per ton for 1919 building.

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Fire Brick Prices Reduced

Following the action of the steel manufacturers in reducing prices, effective from March 21, leading manufacturers of fire brick have made a general reduction of about 10 per cent., effective from April 1. A previous reduction of 10 per cent was made, effective from January 1, following the reduction in steel prices at that time. Pennsylvania first quality clay brick, which, prior to Jan. 1, was \$45 per 1000, was reduced on Jan. 1 to \$40, and this last reduction of 10 per cent brings the price of this brick to \$36 per 1000. Pennsylvania silica brick, which prior to Jan. 1 was \$50, was reduced, effective from that date to \$45, and has been further reduced, effective from April 1, to \$40.50 per 1000. Ohio and Kentucky clay brick, which prior to Jan. 1 was \$45, but effective from that date, was reduced to \$40, has again been reduced to \$36 per 1000. Western silica brick produced in the Chicago district, which was \$55 per 1000 prior to Jan. 1, was reduced to \$50.50, effective from that date, has been further reduced to \$45.50 per 1000, effective April 1. Magnesite brick, produced at Baltimore, Chester and Sandy Ridge, Pa., is now quoted at \$80 per gross ton at works.

The Debevoise-Anderson Co., Inc., New York, has opened an office in Philadelphia, Room 709 Stephen Girard Building. The company is a seller of pig iron, ore, coke, coal and limestone.

MAKING LESS PIG IRON

Net Loss of 40 Active Furnaces

March Total, 3,090,243 Gross Tons—Daily Rate
12.5 Per Cent Below High Record—Capa-
city in Blast, 93,140 Tons Daily April 1

The pig iron output for March amounted to 3,090,243 gross tons or 99,685 tons a day, as compared with 2,940,168 tons, or 105,006 tons daily in February. This average rate of production is 5 per cent less than that in February, 6.5 per cent less than in January, and 12.5 per cent less than the 113,942 tons daily in last September, the record month. March output is less than February for the first time since 1913. There was a net loss of 40 furnaces during the month, 44 being blown out and only 4 going in. Of 26,644 gross tons of ferroalloys produced 77 per cent was ferromanganese.

Output by Districts

The accompanying table gives the production of all coke and anthracite furnaces for March and the three months preceding:

Pig-Iron Production by Districts—Gross Tons	Gross Tons			
	Dec. (31 days)	Jan. (31 days)	Feb. (28 days)	Mar. (31 days)
New York	231,848	217,762	181,998	194,375
New Jersey	18,462	18,038	16,326	23,437
Lehigh Valley	127,646	93,948	74,970	90,086
Schuylkill Valley	96,813	95,234	85,644	81,683
Lower Susquehanna and Lebanon Valleys	76,640	55,221	48,724	49,743
Pittsburgh district	687,265	668,156	593,453	661,307
Shenango Valley	153,918	147,011	133,825	144,918
Western Pennsylvania	171,252	179,271	139,371	140,364
Maryland, Virginia and Kentucky	90,386	85,043	80,372	78,748
Wheeling district	134,046	141,066	120,908	115,104
Mahoning Valley	330,388	327,690	299,464	285,944
Central and Northern Ohio	301,622	311,322	286,015	319,768
Southern Ohio	67,272	65,274	46,015	48,820
Chicago district	587,709	564,494	510,763	532,511
Mich., Minn., Mo., Wis., Col. and Wash.	119,518	124,494	112,971	117,682
Alabama	208,151	181,313	185,570	182,845
Tennessee	30,681	26,923	23,779	22,908
Total	3,433,617	3,302,260	2,940,168	3,090,243

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from March, 1918, is as follows:

Daily Rate of Pig-Iron Production by Months—Gross Tons	Gross Tons		
	Steel Works	Merchant	Total
March, 1918	74,526	29,122	103,648
April	79,199	30,408	109,607
May	81,238	29,937	111,175
June	81,734	29,059	110,793
July	79,248	31,106	110,354
August	80,947	28,394	109,341
September	83,579	30,363	113,942
October	83,686	28,796	112,482
November	83,395	28,407	111,802
December	81,445	29,317	110,762
January, 1919	78,388	28,137	106,525
February	78,910	26,096	105,006
March	73,468	26,217	99,685

The figures for daily average production, beginning with January, 1913, are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1913—

	Gross Tons					
	1913	1914	1915	1916	1917	1918
Jan.	90,172	60,808	51,659	102,746	101,643	77,799
Feb.	92,369	67,453	59,813	106,456	94,473	82,835
Mar.	89,147	75,738	66,575	107,667	104,882	103,648
Apr.	91,759	75,665	70,550	107,592	111,165	109,607
May	91,039	67,506	73,015	108,422	110,238	111,175
June	87,619	63,916	79,361	107,053	109,002	110,793
July	82,601	63,150	82,691	104,017	107,820	110,354
Aug.	82,057	64,363	89,666	103,346	104,772	109,341
Sept.	83,531	62,753	95,085	106,745	104,465	113,942
Oct.	82,133	57,361	100,822	113,189	106,550	112,482
Nov.	74,453	50,611	101,244	110,394	106,859	111,802
Dec.	63,987	48,896	103,333	102,537	92,997	110,762

Among the furnaces blown out were Port Henry in New York; Crane, Hokendauqua and Lock Ridge in Lehigh Valley; one Swede, Warwick "A" and one Worth in Schuylkill Valley; Lochiel and one Steelton in lower Susquehanna Valley; Colebrook in Lebanon

Valley; one Donora and one Shoenberger, No. 2 Carrie and No. 4 Monongahela in Pittsburgh district; one Shenango in Shenango Valley; one Johnstown, Marshall, Rebecca and Scottdale in western Pennsylvania; Covington and Oriskany in Virginia; one Bethlehem in Maryland; Ashland in Kentucky; three Carnegie and Martin's Ferry in Wheeling district; one Ohio, No. 1 Haselton and two Hubbard in Mahoning Valley; Zanesville in Ohio; Union in southern Ohio; No. 4 Joliet and two South Chicago stacks in Illinois; Thomas in Wisconsin; Clifton, Alabama City, Sheffield City and two Woodward in Alabama, and Napier and No. 2 Rockwood in Tennessee.

The furnaces blown in include one Donora and one Shoenberger in the Pittsburgh district, and one Newburgh in Cleveland.

Capacity in Blast April 1

The following table shows the number of furnaces in blast April 1 in the different districts, also the number and daily capacity in gross tons of furnaces in blast March 1:

Coke and Anthracite Furnaces in Blast	Location of furnaces	Total Number of stacks	April 1		March 1	
			Number in blast	Capacity per day	Number in blast	Capacity per day
New York:	Buffalo	21	14	5,485	15	5,171
	Ferro	1	1	80	0	0
	Other N. Y.	4	2	485	2	75
New Jersey	5	3	755	3	755	3
Pennsylvania:	Lehigh Valley ..	18	13	2,360	16	3,000
	Spiegel	2	1	95	1	95
	Schuylkill Val. ..	15	7	2,035	9	2,600
	Lower Susquehanna ..	9	2	790	3	1,000
	Ferro	2	0	0	1	0
	Lebanon Valley ..	6	2	385	2	385
	Spiegel	4	1	65	2	300
	Pittsburgh Dist. ..	52	44	20,935	46	20,640
	Ferro and Spiegel ..	5	3	420	3	420
	Shenango Val.	19	14	4,675	15	5,020
	Western Pa.	25	14	3,900	16	4,315
	Ferro and Spiegel ..	3	0	0	2	175
Maryland	4	2	715	3	1,040	3
Wheeling District ..	14	8	2,860	12	4,070	12
Ohio:	Mahoning Val.	27	18	8,505	22	10,050
	Central and Northern ..	26	24	10,290	24	10,215
	Southern	17	11	1,600	11	1,600
	Illinois and Ind.	40	32	16,065	36	17,750
	Ferro	1	1	70	0	0
	Mich., Wis. and Minn.	13	9	2,525	10	2,550
	Col., Mo. and Wash.	8	4	1,200	4	1,200
The South:	Virginia	15	9	1,210	9	1,210
	Ferro	4	1	65	2	100
	Kentucky	7	3	330	4	330
	Alabama	45	16	4,625	22	5,000
	Ferro	1	0	0	1	0
	Tennessee	16	7	640	9	860
Total		429	266	93,165	306	101,475

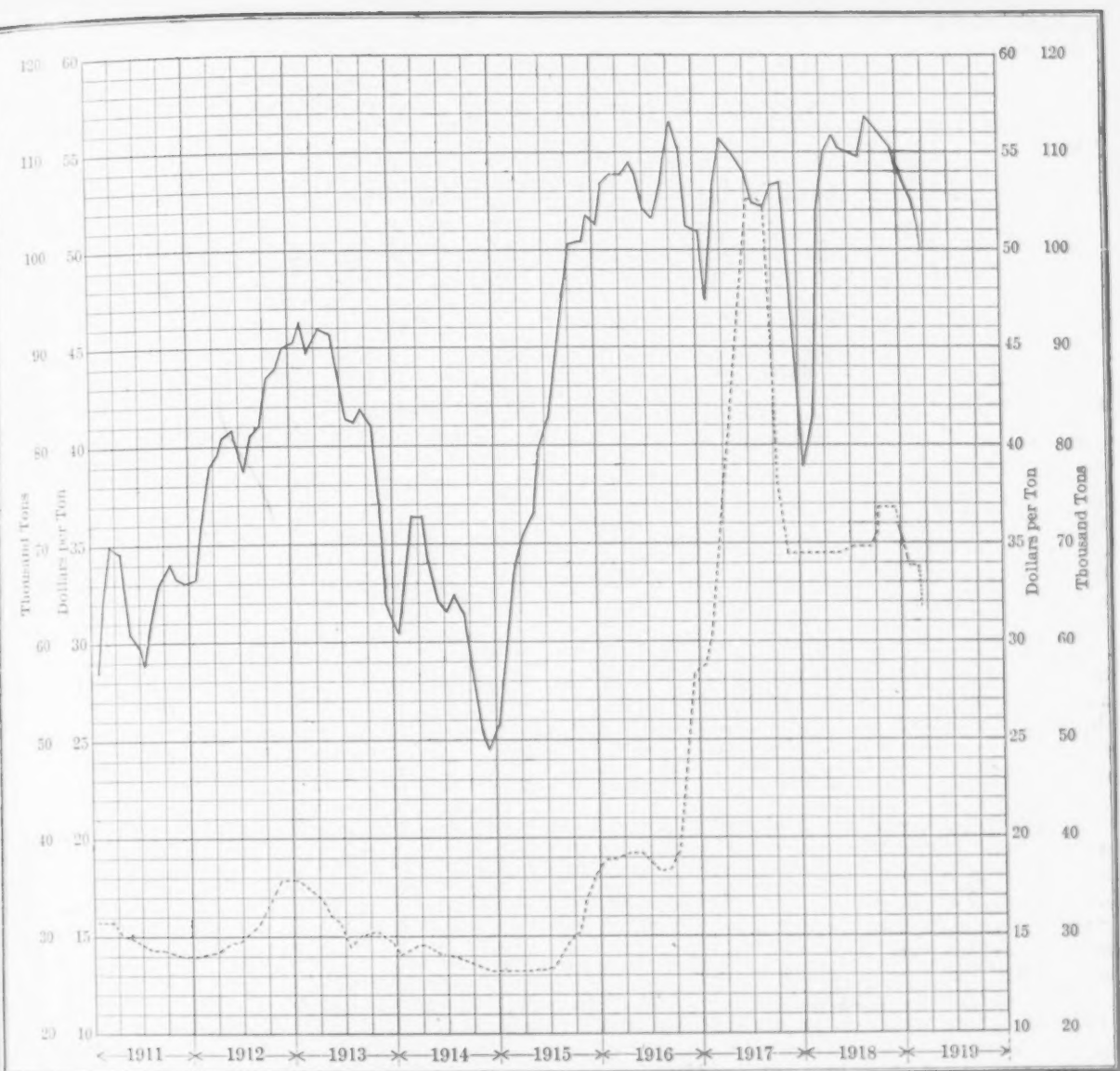
Production of Steel Companies

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies show the following totals of steelmaking iron month by month, together with ferromanganese and spiegeleisen. These last, while stated separately, are also included in the columns of "total production."

Production of Steel Companies—Gross Tons	Total Production			Spiegeleisen and Ferromanganese	
	1917	1918	1919	1917	1918
Jan.	2,244,203	1,756,208	2,430,022	38,792	30,695
Feb.	1,829,846	1,620,254	2,209,470	32,137	26,114
Mar.	2,285,430	2,349,419	2,277,507	36,563	39,122
Apr.	2,370,937	2,411,488	.....	39,595	35,531
May	2,404,380	2,513,577	.....	37,701	54,633
June	2,304,155	2,407,166	.....	30,829	44,844
July	2,369,630	2,456,693	.....	43,884	51,762
Aug.	2,214,513	2,509,357	.....	39,492	54,009
Sept.	2,198,705	2,507,381	.....	42,235	66,275
Oct.	2,376,589	2,594,277	.....	48,691	70,379
Nov.	2,349,545	2,501,867	.....	34,688	59,628
Dec.	2,094,659	2,524,794	.....	29,902	49,455

Diagram of Pig-Iron Production and Prices

The fluctuations in pig-iron production from 1910 to the present time are shown in the accompanying chart. The figures represented by the heavy line are those of daily average production by months of coke and anthracite iron. The dotted curve on the chart represents



The Full Line Represents the Daily Production of Pig Iron and the Dotted Line Is the Average of the Price Per Ton of No. 2 Southern Pig Iron at Cincinnati, Local No. 2 Iron at Chicago and No. 2X Iron at Philadelphia

monthly average prices of Southern No. 2 foundry pig iron at Cincinnati, local No. 2 foundry iron at furnace at Chicago, and No. 2 X at Philadelphia. They are based on the weekly market quotation of THE IRON AGE.

Production of Coke and Anthracite Pig Iron in the United States by Months, Beginning Jan. 1, 1915—Gross Tons

	1915	1916	1917	1918	1919
Jan.	1,601,421	3,185,121	3,150,938	2,411,768	3,302,260
Feb.	1,674,771	3,087,212	2,645,247	2,319,299	2,940,168
Mar.	2,063,834	3,337,691	3,251,352	3,213,091	3,090,243
3 mos.	5,340,026	9,610,024	9,047,537	7,944,158	9,332,671
Apr.	2,116,494	3,227,768	3,334,960	3,288,211	.....
May	2,263,470	3,361,073	3,417,340	3,446,412	.....
June	2,380,827	3,211,588	3,270,055	3,323,791	.....
July	2,563,420	3,224,513	3,342,438	3,420,988	.....
Aug.	2,779,647	3,203,713	3,247,947	3,389,585	.....
Sept.	2,852,561	3,202,366	3,133,954	3,418,270	.....
Oct.	3,125,491	3,508,849	3,303,038	3,486,941	.....
Nov.	3,037,308	3,311,811	3,205,794	3,354,074	.....
Dec.	3,203,322	3,178,651	2,882,918	3,433,617	.....
Total	29,662,566	39,039,356	38,185,981	38,506,249	.....

*These totals do not include charcoal pig iron. The 1918 production of this iron was 347,224 tons.

Blast Furnace Notes

The Carnegie Steel Co., Pittsburgh, is taking advantage of the present quiet market to put its blast furnaces in first-class condition. On March 5 it blew out Carrie No. 2; on March 15, Ohio No. 5 and Mingo No. 3; March 18, Bellaire No. 1 was blown out and No. 2 was banked. Zanesville was blown out March 6, and probably will not be active again for some time. This is an isolated high-cost stack.

The Keystone furnace of the Reading Iron Co. is

reported to have gone out of blast after being in operation for one year. General repairs will be started at an early date.

The Sharpsville Furnace Co., Sharpsville, Pa., shut down its blast furnace April 5 for an indefinite period. The plant will again be placed in operation when sufficient orders mature.

The McKinney Steel Co., Cleveland, blew out its No. 3 furnace April 4 for relining.

The Sloss-Sheffield Steel & Iron Co. has banked a City furnace and now has only two active stacks. The only other active ones in Alabama are nine of the Tennessee company, two of the Republic Iron & Steel Co., one Alabama Co., one Central Coal & Iron, and one Woodstock. This is a total of 16 stacks, compared with an average of 32 in 1918.

The Texas Steel Co., Beaumont, has rehabilitated the blast furnace at Rusk, which it purchased from the State of Texas, and placed it in operation. The pipe foundry at Rusk will soon be placed in operation by the company after a long shutdown.

YOUNGSTOWN, April 7.—Eight blast furnaces in the Mahoning Valley are either suspended or banked. The Youngstown Sheet & Tube Co. has three idle stacks, one at the East Youngstown battery and both Hubbard furnaces at Hubbard, Trumbull County. The Republic Iron & Steel Co. has three down, Hannah furnace and two at Hazelton. The Carnegie Steel Co. has No. 5 down at the Ohio works for relining, while one furnace of the Brier Hill Steel Co. is undergoing overhauling.

Iron and Steel Markets

OPEN MARKET PREDICTED

Buying Halted by Railroad Administration's Stand

Further Curtailment of Production—Some Reductions in Wages

The price-fixing wrangle at Washington has halted business in iron and steel. While ostensibly some development from the repeated conferences between the heads of the Industrial Board and the Railroad Administration is awaited, the belief is widespread that confidence in co-operative price maintenance has been shattered.

Those buyers of steel products who considered that the recent reductions did not go far enough have been quick to predict competitive prices, and there have not been wanting, even among producers, advocates of an open market as the shortest road to a basis that will invite the free placing of orders.

The outstanding feature in that connection is the growing expectation that the readjustment in iron and steel will take in labor as well as products. All that has been said about wage maintenance has ignored the fact that 50 per cent operation of mills, as is the case with most independent steel companies, has already made inroads on weekly wage earnings. Here and there also slight reductions have been made in wage rates, particularly at blast furnaces and in common labor at smaller mills. At some Eastern iron mills puddlers' wages, in line with recent declines in bar iron, have been reduced from \$12.75 to \$9.25 per ton.

The price of steel rails, which has been the storm center at Washington, is the lowest on the list of finished materials, being 2c. per pound for Bessemer and approximately 2.10c. per pound for open-hearth rails, whereas bars, the cheapest of the other finished products, are 2.35c. Other materials, therefore, hold out more chance of further reduction than rails.

Indications are plainer that the pig-iron trade will take its own course independent of the recent conference decisions at Washington. Producers having their own raw materials will continue to operate, making prices that will take business; but meanwhile the list of idle furnaces is growing rapidly. In March there was a loss of no less than 40 stacks, the number active April 1 being 266, against 306 one month previous.

Pig-iron output was 3,090,243 gross tons in March, or 99,685 tons a day, against 2,940,168 tons in February, or 105,006 tons a day. Furnaces active on April 1 were capable of producing 93,165 tons a day, against 101,475 tons a day as the rated capacity active on March 1. Since Dec. 1, 94 furnaces have been blown out. Nevertheless, pig-iron stocks have increased steadily, and further curtailment in output is scheduled.

The plentiful supply of coke, with the slowing down of blast-furnace operations, has brought a 25c. reduction to \$3.75 per net ton.

Again the automobile industry is conspicuous as a buyer in an otherwise stagnant market. It is

placing orders for second quarter shipments for its third quarter production, but is expecting to get the benefit of any downward price revisions.

The sheet trade is suffering especially from overproduction. Some of the heavier gages are being quoted at plate prices, a reduction of more than \$7 per ton.

A cut of 5c. per pound has been made in high-speed steel.

At least one maker has sold hard steel bars, as for reinforcing purposes, at \$2 a ton below the mild steel basis.

Agricultural implement makers are sounding producers as to readjustments on various steel specialties which were not changed at the time of last month's general price reductions.

Fresh railroad spike inquiries total about 6000 kegs, but these may vanish like the 4500-keg proposal of the Grand Trunk this week.

The Government is disposing of some of its shell forgings, one sale of 10,000 tons to an Eastern steel plant at \$16.50 being reported. These shells had been partly finished, even to the copper bands.

One steel plant has shut down on account of reported inability to meet the March price schedules.

Ferromanganese production continues large in comparison with that of steel. The March output was about 20,000 tons, bringing the total for the first quarter to about 63,000 tons. This, with nearly 7000 tons of British alloy imported to March 15 and 12,000 to 15,000 tons still to come, will focus attention on prices in that market in the immediate future.

Negotiations for American sheet bars for export to Great Britain have developed some low prices, which British steel works are not likely to meet at present high costs there and the prospect of higher as coal miners' wages advance. The removal of British Government subsidies on steel April 30 is expected to bring an advance of 50 shillings in domestic prices there or practically to the level of recent export prices. In tin plate bars an advance of £2 is looked for which would bring tin plates up to about 36s.

Pittsburgh

PITTSBURGH, April 8—(By Wire).

The refusal of Director General of Railroads Hines to accept the price of \$45 for standard Bessemer rails and \$47 for standard open-hearth rails, and the deadlock that has since existed between Mr. Hines and the Industrial Board of the Department of Commerce at Washington have thrown the whole steel trade into a condition of chaos and have paralyzed business. While opinions vary as to the soundness of Mr. Hines' position in this controversy, there are a good many expressions in the steel trade here in his favor and the position he has taken is indorsed by the heads of various local iron and steel companies. Particularly is this true of his decision to deal with the steel mills direct in his purchases of rails, also with the coal producers for purchases of coal, rather than with heads of committees sitting at Washington for the purpose of fixing prices, and then asking Mr. Hines and general consumers as well to pay them. The belief is that Mr. Hines has been impressed by the large earnings of the steel companies in the past three years or more, while

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Apr. 8, 1919	Apr. 1, 1919	Mar. 11, 1919	Mar. 13, 1918
No. 2 X, Philadelphia...	\$31.90	\$31.90	\$36.15	\$34.25
No. 2 Valley furnace...	26.75	26.75	28.00	33.00
No. 2 Southern, Cin'tif...	30.35	30.35	34.60	35.90
No. 2 Birmingham, Ala...	26.75	26.75	29.00	33.00
No. 2 furnace, Chicago...	26.75	26.75	31.00	33.00
Basic, deliv., eastern Pa.	29.65	29.65	33.90	33.75
Basic, Valley furnace...	25.75	25.75	30.00	33.00
Bessemer, Pittsburgh...	29.35	29.35	33.60	37.25
Malleable, Chicago...	27.25	27.25	31.50	33.50
Malleable, Valley...	27.25	27.25	31.50	33.50
Gray forge, Pittsburgh...	27.15	27.15	31.40	32.75
L. S. charcoal, Chicago...	38.85	38.85	38.85	37.50

Rails, Billets, etc.,

Per Gross Ton:	Apr. 8, 1919	Apr. 1, 1919	Mar. 11, 1919	Mar. 13, 1918
Best rails, heavy, at mill...	45.00	45.00	55.00	55.00
O. h. rails, heavy, at mill...	47.00	47.00	57.00	57.00
Best billets, Pittsburgh...	38.50	38.50	43.50	47.50
O. h. billets, Pittsburgh...	38.50	38.50	43.50	47.50
O. h. sheet bars, P'gh...	42.00	42.00	47.00	51.00
Forging billets, base, P'gh...	51.00	51.00	56.00	60.00
O. h. billets, Phila...	42.50	42.50	47.50	50.50
Wire rods, Pittsburgh...	52.00	52.00	57.00	57.00

Finished Iron and Steel,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.595	2.595	3.145	3.685
Iron bars, Pittsburgh...	2.35	2.35	2.90	3.50
Iron bars, Chicago...	2.50	2.50	2.92	3.50
Steel bars, Pittsburgh...	3.35	2.35	2.70	2.90
Steel bars, New York...	2.65	2.65	3.00	3.25
Tank plates, Pittsburgh...	2.92	2.92	3.17	3.445
Tank plates, New York...	2.45	2.45	2.80	3.00
Beams, etc., Pittsburgh...	4.75	2.72	3.07	3.195
Beams, etc., New York...	2.72	2.72	2.90	3.00
Skelp, grooved steel, P'gh...	2.45	2.45	3.00	3.25
Skelp, sheared steel, P'gh...	2.65	2.65	3.00	3.25
Steel hoops, Pittsburgh...	3.05	3.05	3.30	3.50

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Per Lb. to Large Buyers:	Apr. 8, 1919	Apr. 1, 1919	Mar. 11, 1919	Mar. 13, 1918
Sheets, black, No. 28, P'gh...	4.35	4.35	4.70	5.00
Sheets, galv., No. 28, P'gh...	5.70	5.70	6.05	6.25
Wire nails, Pittsburgh...	3.25	3.25	3.50	3.50
Cut nails, Pittsburgh...	4.25	4.25	5.00	4.00
Fence wire, base, P'gh...	3.00	3.00	3.25	3.25
Barbed wire, galv., P'gh...	4.10	4.10	4.35	4.35

Old Material, Per Gross Ton

Per Gross Ton:	Apr. 8, 1919	Apr. 1, 1919	Mar. 11, 1919	Mar. 13, 1918
Carwheels, Chicago...	21.00	21.00	21.00	20.00
Carwheels, Philadelphia...	24.00	24.00	23.00	30.00
Heavy steel scrap, P'gh...	15.50	16.00	14.00	30.00
Heavy steel scrap, Phila...	15.50	16.00	13.75	29.00
Heavy steel scrap, Ch'go...	16.50	16.50	15.00	29.50
No. 1 cast, Pittsburgh...	18.00	20.00	18.00	30.00
No. 1 cast, Philadelphia...	22.00	22.00	21.00	30.00
No. 1 cast, Ch'go, net ton...	22.00	22.00	21.00	26.75
No. 1 RR. wrot., Phila...	22.00	22.00	20.00	35.00
No. 1 RR. wrot., Ch'go, net...	16.00	16.00	15.50	30.75

Coke, Connellsville,

Per Net Ton at Oven:

Per Net Ton at Oven:	Apr. 8, 1919	Apr. 1, 1919	Mar. 11, 1919	Mar. 13, 1918
Furnace coke, prompt...	\$3.25	\$4.00	\$4.00	\$6.00
Furnace coke, future...	4.25	4.50	5.00	6.00
Foundry coke, prompt...	4.50	5.00	5.00	7.00
Foundry coke, future...	5.00	5.50	5.50	7.00

Metals,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York...	15.62½	15.62½	15.75	23.50
Electrolytic copper, N. Y...	15.37½	15.37½	15.00	23.50
Spelter, St. Louis...	6.30	6.20	6.15	7.50
Spelter, New York...	6.65	6.55	6.50	7.75
Lead, St. Louis...	5.00	5.00	5.00	7.10
Lead, New York...	5.25	5.25	5.25	7.25
Tin, New York...	72.50	72.50	72.50	85.00
Antimony (English), N. Y...	6.62½	6.25	7.00	13.25
Antimony (Asiatic), N. Y...	6.62½	6.25	7.00	13.25
Tin plate, 100-lb. box, P'gh...	\$7.00	\$7.00	\$7.35	\$7.75

on the other hand he is very familiar with the fact that the railroads have shown a deficit in operations ever since being taken over by the Government, and he proposes, if possible, to put the railroads on a stable basis where they can earn at least fixed charges and possibly show a surplus. In order to do this Mr. Hines is going to scan very closely the prices he will pay for material and supplies.

There is some objection in the trade to the term "fixed prices." A buyer of steel, it is argued, if he is paying a price fixed by agreement and not by the law of supply and demand, is not inclined to place a great deal of confidence in that price. That is clearly demonstrated in the events that have taken place in the steel trade since Jan. 1. On that date reductions in prices ranging from \$3 on pig iron up to \$6 on some kinds of finished steel were made, with the expectation that the consuming trade would take hold. That this was not the case is a matter of recent record. Again through the solicitation of Government officials the American Iron and Steel Institute appointed a committee to confer with the Industrial Board with regard to another reduction in prices, which was again made, ranging from \$4.25 on pig iron to \$7 on finished steel, with the exception of wire products, which were reduced \$5. The response of the trade to this second reduction in prices was a little more pronounced than to the first reduction, and some new business was placed with the mills at the prices effective from March 21, but it was very largely business held up waiting the lower prices, and no doubt much of it would have been placed had there been no reduction. In the opinion of not a few in the trade, from Jan. 1, when the War Industries Board gave up control of steel prices, it would have been better had all committees been discharged and an open market declared, and the law of supply and demand allowed to govern the situation as in pre-war times. Certain it is that the efforts to fix steel prices and expect consumers to fall in line and place orders have not been successful.

Should the market be declared open it would no doubt mean much lower prices on iron and steel than those named as in effect from March 21, but as soon as the trade gets the idea that prices have touched bottom, then we can expect a revival in the steel demand that will give the mills more work and lead to higher prices as the demand grows. At this writing no definite word has been received as to probable action to be taken at Washington, and the trade looks for an open market within a very short time. In the meantime, trade is stagnant, very few new orders being placed, and these only for small lots for actual needs and quick shipment.

Pig Iron.—The local pig iron market in the past week has been practically dead, there being no inquiry and no efforts on the part of furnaces to make sales, they realizing that it is useless to do so till the muddle in Washington in regard to prices has been cleared up. The Standard Sanitary Mfg. Co. has bought 2000 to 2500 tons of Southern foundry iron for its Louisville works at the reported prices in effect from March 21. Aside from this nothing has been done, nor likely to be, under present chaotic conditions. Blast furnaces are steadily being blown out, owing to no demand for iron, and also to the fact that they cannot compete at present market prices. Very few merchant furnaces that sell their pig iron to the trade will be in operation when this month ends. No less than five or six stacks in the Youngstown district will go out within the next week or two. Prices are nominal and are as follows:

Basic pig iron, \$25.75; Bessemer, \$27.95; gray forge, \$25.75; No. 2 foundry, \$26.75; No. 3 foundry, \$26.25; and malleable, \$27.25; all per gross ton at Valley furnaces, the freight rate for delivery in the Cleveland and Pittsburgh districts being \$1.40 per ton.

Ferroalloys.—Resale material is governing the local market entirely on alloys and new inquiry is very dull. Consumers are filled up for months ahead. Some have surplus stocks of alloys which they are offering freely in the open market at the best prices they can get.

Resale 80 per cent ferromanganese is offered at \$130 to \$135, with sales of 78 to 82 per cent having been made at \$130, delivered. Resale 50 per cent ferrosilicon is freely offered at \$90, delivered. The price of makers of 18 to 22 per cent spiegeleisen is \$40, but resale is offered at \$35 per gross ton delivered.

We quote 78 to 82 per cent resale ferromanganese at \$130 to \$135, delivered, with a reduction of about \$2 per unit for lower percentages. We quote resale 50 per cent ferrosilicon at \$90 to \$95 and resale 18 to 22 per cent spiegeleisen at \$35, delivered. Prices on the lower grades of Bessemer ferrosilicon are very much lower, having declined \$8 to \$9 per ton. We now quote 9 per cent Bessemer ferrosilicon at \$43; 10 per cent, \$45; 11 per cent, \$48; 12 per cent, \$51. We quote 6 per cent silvery iron, \$35; 7 per cent, \$36; 8 per cent, \$38.50; 9 per cent, \$40.50, and 10 per cent, \$47. About \$3 per gross ton advance is charged for each 1 per cent silicon for 11 per cent and over. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, which have a uniform freight rate of \$2.90 per gross ton for delivery in the Pittsburgh district.

Billets and Sheet Bars.—The lower prices on billets and sheet bars effective from March 21 have not brought about any more business. But on the contrary the whole market has settled down to inactivity, waiting for further developments as to prices to come from Washington. Should the market be declared open, there is no doubt that prices on semi-finished steel would soon show a decline from present values. Mills and dealers say there is no inquiry, and operations among steel mills in the Pittsburgh, Youngstown and Wheeling districts are on about a 60 per cent basis. Prices are nominal as follows:

We quote 4 x 4 in. soft Bessemer and open-hearth billets at \$38.50, 2 x 2 in. billets at \$42; sheet bars, \$42; slabs, \$41, and forging billets \$51 base, all f.o.b. at mill, Pittsburgh or Youngstown.

Plates.—There is absolutely no demand for plates, the Government having held up all new orders for cars, and has not recently given out work of any kind. Plate mills are down to an operation of not more than 50 per cent, while some close down one week and start up the next on accumulated orders. No new projects involving large quantities of plates are under way and railroads are doing nothing. No betterment in the plate trade can be looked for until the Washington situation has cleared. We quote 1/4-in. and heavier sheared plates at 2.65c. at mill.

Structural Material.—Inquiry is very light and practically no new work is being placed, nor is it likely it will be while the present chaotic conditions as to prices remain. The McClintic-Marshall Co. has taken 800 tons for a plant extension at Pontiac, Mich. The proposed Hanna Building in Cleveland, which it is said will call for about 25,000 tons, has been indefinitely hung up. Fabricating plants are not operating to more than 50 per cent, and will likely be running at a less rate in the near future.

We quote beams and channels up to 15 in. at 2.45c. at mill, Pittsburgh.

Iron and Steel Bars.—Right after the \$7 per ton reduction in steel bars was made, some orders came to the mills, but these were largely business that was held up waiting for the lower prices. Mills rolling iron and steel bars report the demand very dull with no prospect of betterment under present uncertain conditions as regards prices. Implement makers are specifying at only a fair rate against contracts.

We quote soft steel bars rolled from billets at 2.35c.; from old steel rails, 2.45c. Bar iron is quoted at 2.35c. for Eastern shipment and 2.55c. for Western shipment.

Sheets.—New business in sheets has quieted down very much in the past week due to the conditions at Washington. After the reduction of \$7 per ton was made, some orders came out to the mills, and it looked for a time as if a good buying movement might be under way, but this has subsided, and demand now is only for carloads and smaller lots to cover actual needs. Independent sheet mills are operating to about 60 per cent, but some are running only 12 turns per week, closing down Friday and Saturday. No increase in demand for sheets is looked for till price conditions have cleared up. Prices on sheets in effect from March 21 are given on page 986.

Tin Plate.—The demand is very dull and is even quieter than before the reduction of \$7 per ton was made in the price. This is no doubt due to the recent unfavorable developments at Washington. One leading mill in this district is down entirely this week for lack of orders, having very large stocks on hand, and other plants are operating at only 50 per cent of capacity or less. Present quiet conditions in the tin plate trade are likely to last till the price conditions at Washington have cleared, or till it is known whether there is to be an open steel market, which at this writing seems likely. We quote tinplate at \$7 per base box, f.o.b. Pittsburgh, and prices on terne plate are given on page 986.

Wire Rods.—New inquiry has quieted down very much, intending buyers holding off till some definite action is taken at Washington on the general steel prices. Common basic, or Bessemer rods, are held at \$52; free-cutting Bessemer screw rods, \$57; chain, screw, rivet and bolt rods, \$60 per gross ton, f.o.b. Pittsburgh. Prices on high carbon rods remain arbitrary and range from \$60 upward, depending on carbons.

Wire Products.—New business in wire and wire nails has settled down to a light demand for actual wants and prompt shipment. Jobbers and consumers are awaiting the outcome of steel prices at Washington, and have the idea that if the market is declared open, prices on wire products may be lower. None of the mills making wire and wire nails is operating to more than 50 per cent of capacity, and some are running at a less rate. Prices on wire products are given in detail on page 986. The extra for galvanizing, including roofing nails, is \$1.50 for nails 1 in. and longer and \$2 for nails shorter than 1 in.

Hot-Rolled Strip Steel.—Mills report demand very quiet and only for small lots to cover actual needs. Consumers are holding off as far as possible until the price situation has cleared up.

We quote hot-rolled strip steel at \$3.30 per 100 lb.

Cold-Rolled Strip Steel.—Makers state that the recent reduction of \$12 per ton brought out a fair amount of new business for prompt shipment, but the demand has quieted down again and is now only for small lots for actual needs and for prompt delivery.

We quote cold-rolled strip steel at \$5.65 base per 100 lb., f.o.b. Pittsburgh, for 1 1/2-in. and wider, 0.100 in. and thicker hard tempered in coils 0.20 carbon and under. Boxing charge 25c. per 100 lb.

Nuts and Bolts.—The recent heavy reduction in prices on nuts and bolts has brought out a little heavier demand, but jobbers and consumers are still inclined to buy only in small lots to cover actual needs. This condition will likely last till the situation at Washington has cleared up and it is known whether there is to be an open steel market or not. The new discounts on nuts and bolts, now in effect, are given on page 986.

Shafting and Screw Stock.—There is a fair demand from the automobile trade, but the implement makers and the screw stock machine people are buying very little. Consumers are no doubt holding off placing orders till it is known whether present discounts will remain in effect. These discounts are as follows:

We quote cold-rolled shafting at 28 per cent off list in carloads and 21 per cent in less than carloads, f.o.b. Pittsburgh.

Hoops and Bands.—Mills report only a fair demand and this is almost entirely for small lots to cover actual needs and for prompt shipment. None of the mills is operating at more than 50 per cent of capacity. We quote steel hoops and bands at 3.05c. f.o.b. Pittsburgh.

Iron and Steel Pipe.—New inquiry has quieted down very much in the past week or so, no doubt due to the uncertainty as to prices. A good many projects are under way that will involve very large quantities of line pipe, and it is said some of these are bound to go through without regard to prices. The demand for oil country goods is still heavy, as development work in the various oil fields, especially in the Ranger Field in Texas, is active. The Philadelphia Co. of this city, which recently came in the market for a good-sized

quantity of tubular goods for its needs for this year, has withdrawn its inquiry, and is buying only in small lots as it needs the material. Discounts on iron and steel pipe, effective from March 21, are given on page 986.

Spikes.—The Seaboard Air Line has an inquiry out for 2000 kegs, the Baltimore & Ohio for 1200 and the Southern Pacific for 2500 kegs. It is not known whether these inquiries will result in orders, as very often of late when a railroad has been given prices it has withdrawn the inquiry and got a supply from some other road. The recent inquiry of the Grand Trunk for 4500 kegs has been withdrawn from the market.

We quote Standard spikes, 9/16 x 4½ in. and also small spikes \$3.35 base per 100 lb. in carload lots of 200 kegs or more plus usual extras. Boat and barge spikes, \$3.85 per 100 lb. in carload lots of 200 kegs or more.

Boiler Tubes.—New inquiry for both iron and steel tubes is only fair, and has quieted down a good deal since the price developments at Washington. Jobbers and consumers are holding up orders till the situation has cleared up. Discounts on iron and steel tubes, in effect at this writing, are given on page 986.

Coke.—The market is very quiet, and the consumption of coke is steadily decreasing on account of so many blast furnaces going out of blast. Spot furnace coke is still plentiful, and a recent sale of standard furnace coke was made on a basis of \$3.65 per net ton at oven. Some contracts for furnace coke for April shipment have been adjusted to the basis of \$4.25, and some at \$4.50 per net ton at oven. We now quote best grades of blast furnace cokes, for prompt shipment at \$3.75 to \$4, and \$4.25 to \$4.50 per net ton on contracts for April delivery. Best grades of 72-hr. foundry coke are selling for prompt shipment at about \$5, or less, per net ton at oven. The output of coke in the Upper and Lower Connellsville regions for the week ending March 29 was 185,660 tons, a decrease from the previous week of about 2200 tons.

Old Material.—The recent notable improvement in the scrap trade has largely subsided, due to the unfavorable price developments at Washington, and consumers have again retired from the market as buyers till the situation has cleared up. Prices on scrap used in steel mills have declined in the past week, from \$1 to \$1.50 per ton, and the whole market is again very quiet. Consumers of scrap do not know at this writing whether the steel market is to be declared open, and in the event of that taking place, believe prices on scrap might show further decline. One sale of 3000 tons of heavy steel scrap was made in the past week, at \$15.50, delivered to consumer's mill. Blast furnaces are buying freely of borings and turnings, but these have declined about \$1 per ton. Prices quoted by dealers at this writing to consumers for delivery to mills in the Pittsburgh district and other consuming points that take Pittsburgh freights are as follows:

Heavy steel, melting, Steubenville, Follanshee, Brackenridge, Monessen, Midland and Pittsburgh, delivered.....	\$15.50
No. 1 cast, for steel plants.....	\$18.00 to 19.00
Rolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Franklin, Pa., and Pittsburgh.....	16.00 to 16.50
Compressed steel.....	13.00 to 13.50
Bundled sheet, sides and ends, f.o.b. consumers' mills, Pittsburgh district.....	11.50 to 12.00
Bundled sheet stamping.....	10.50 to 11.00
No. 1 busheling.....	14.00 to 14.50
Railroad grate bars.....	14.00 to 15.00
Low phosphorus melting stock (bloom and billet ends, heavy plates) ¼ in. and heavier.....	22.00 to 23.00
Locomotive axles.....	29.00 to 30.00
Locomotive axles, steel.....	28.00 to 29.00
Steel car axles.....	25.00 to 26.00
Railroad malleable.....	15.00 to 15.50
Machine shop turnings.....	10.00 to 10.50
Cast iron wheels.....	20.00 to 21.00
Roller steel wheels.....	17.00 to 18.00
Sheet bar crop ends (at origin).....	18.00 to 18.50
Heavy steel axle turnings.....	12.00 to 13.00
Heavy breakable cast.....	18.00 to 19.00
Cast iron borings.....	10.50 to 11.00
No. 1 railroad wrought.....	19.00 to 19.50

Pittsburgh and Nearby Districts

Pittsburgh steel manufacturers have subscribed to a fund for the establishing of a rolling mill research laboratory at Carnegie Institute of Technology in Pittsburgh. The work of organizing the laboratory and its staff was recently undertaken by William P. Shinkle, who has been selected as its directing head. Mr. Shinkle has been connected with the Carnegie Steel Co. for many years, but has resigned in order to devote his entire time to his new position. He worked in steel mills and machine shops for 15 years, and then entered the night school of Carnegie Institute. He was identified with the Schoen works of the Carnegie Steel Co. and later was engineer of the shell department of the Neville Island ordnance plant, construction of which was abandoned with the signing of the armistice, returning to the Carnegie Co. on the withdrawal of the United States Steel Corporation from the Neville Island project.

The Aspromet Co., First National Bank Building, Pittsburgh, has changed its name to the H. H. Robertson Co.

The Bessemer department of the Cambria Steel Co., Johnstown, Pa., which was closed down for three weeks for lack of orders, started up March 31. The new plate mill of the company, put in operation last year, and which worked almost entirely on Government orders for plates, is closed down on account of lack of orders.

The Bellebridge Coal & Coke Co. has been organized by Frank M. Howard and W. Y. Humphreys, and has opened offices in room 705, Henry W. Oliver Building, Pittsburgh. Mr. Humphreys for many years was president of the Bessemer Coke Co., now owned by the J. H. Hillman Sons Co., Pittsburgh.

Birmingham

BIRMINGHAM, ALA., April 7.

Pig Iron.—One Southern iron producer sold around 3,000 tons of iron in the last week of March, the best week's business in 1919. One lot was for 2,000 tons and went to a Southern consumer for his second and third quarter as well as prompt needs. All other sales made were from carlots to a few hundred tons. In all cases the full silicon differential is charged, the largest deal of the recent past being for metal that brings \$31.75 per ton. It cannot be said that the week preceding the declaration by Director General Hines showed any decided improvement and there has been no important development since.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, 1.75 to 2.25 silicon.....	\$26.75
Basic.....	25.75

Cast-Iron Pipe.—The cast-iron pipe trade had commenced to look up prior to the sensation caused by Mr. Hines' action and the sanitary trade especially had begun taking on quite a respectable lot of new business. Pipe shops do not expect full operations under any circumstances, but were greatly relieved at the change.

Old Material.—A satisfactory volume of cast scrap and stove plate is moving from some yards, but there is little or no market for anything else, steel being a drug on the market. We quote per gross ton f.o.b. Birmingham district yards, prices to consumers as follows:

Steel rails.....	\$10.50 to \$11.00
No. 1 heavy steel.....	11.00 to 12.00
Cast iron borings.....	6.00 to 6.50
Machine shop turnings.....	6.00 to 6.50
Stove plate.....	13.00 to 13.50
No. 1 cast.....	19.00 to 19.50
Car wheels.....	19.00 to 19.50
Tramcar wheels.....	18.00 to 18.50
Steel axles.....	17.00 to 18.00
No. 1 wrought.....	12.00 to 13.00

The Youngstown Foundry & Machine Co., Youngstown, Ohio, which has had plans made for some time for the building of a new plant at Girard, Ohio, states that nothing will be done now in regard to building on account of the high prices of material and labor.

Chicago

CHICAGO, April 7—(By Wire).

The refusal of the Railroad Administration to accept the prices fixed by the Industrial Board and the iron and steel interests has halted such business as promised to develop as a result of the reductions. Consumers have resumed a waiting attitude. Opinions vary as to the effects of an open market, if it comes. Iron makers assert that efficient furnaces are now operating at close to cost and steel producers do not see how further reductions can be made unless wages are cut. Labor trouble is regarded as a possibility, if wage reductions prove necessary. In this connection, the employees' representation plan started by the leading independent in this district at the first of the year would undergo its first real test. Under this scheme, committees of workers are consulted regarding contemplated changes in wages, working conditions, welfare work, etc.

That the significance of the price situation has been grasped abroad is evidenced by a curtailment of export business.

The average foundry capacity in operation is between 30 and 40 per cent, with the melters serving the automobile industry the most active. The leading steel interest continues to operate at about 80 per cent of capacity whereas the foremost independent is operating at 40 per cent. The only important structural order reported was 2500 tons which the Warren City Tank & Boiler Co., Warren, Ohio, will fabricate for the Crown Oil & Refining Co., Pasadena, Texas.

Ferroalloys.—The market for both ferromanganese and ferrosilicon remains dormant as far as producers are concerned because of the resale lots which are still being offered. There is no means of estimating how long this condition will exist, but it will last until the resale material is disposed of. A producer offers ferromanganese 80 per cent at \$150 delivered, while resale can be obtained for close to \$100. There has been no activity in spiegeleisen.

We quote 80 per cent ferromanganese nominal at \$150 delivered; 50 per cent ferrosilicon at \$125 to \$130, delivered, and 16 to 18 per cent spiegeleisen at \$40 to \$45 furnace.

Pig Iron.—Consumers have resumed a policy of waiting for developments at Washington. While the first influence of the price adjustment was to bring out a considerable number of small orders and an appreciable amount of inquiry, the refusal of the Railroad Administration to recognize the scale established by the Industrial Board has put a quietus on activity in the market. Even if the stabilization plan fails and an open market obtains, it is doubted by producers whether a further decline in prices would result as furnaces are now operating at close to production cost. A possibility of reduced freight on ore is seen, but it is felt that no decline in coke prices is in sight. Should competition force radical efforts to lower costs, it is regarded as probable that wage rates will be cut. In this connection it is pointed out that the collapse of the suggested prices will relieve producers of the obligation to maintain the existing wage level. So far there is no evidence of any inclination on the part of makers to deviate from the established prices in view of their doubtful status, although small lots of resale malleable have been offered at from \$1 to \$1.50 below the market. An iron and steel company making Southern iron, following the example of Pickands, Brown & Co. and the Tennessee Coal, Iron & Railroad Co., has made the new prices retroactive with some minor exceptions, on orders not shipped before April 1. One maker which has adopted this policy is now shipping iron previously held on the theory that consumers asked that deliveries be delayed in the hope that prices would be reduced and applied on their contracts. Foundries are now operating at between 30 and 40 per cent of capacity. But this is an average and does not represent the condition of individual plants, some of which are running full and others doing very little. Foundries making malleable castings for automobile manufacturers are active, but those producing malleable castings for railroads are quiet. Gray iron foundries

are fairly active, although the situation is spotty. A further reduction in the number of active furnaces is contemplated until there is a marked turn in the demand.

The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, average silicon 1.50, second half delivery, f.o.b. furnace, average freight to Chicago \$2.50 (other grades subject to usual differentials).....	\$29.25
Lake Superior charcoal, first half, nominal....	38.85
Northern coke foundry, No. 1 silicon, 2.25 to 2.75	28.00
Northern coke foundry, No. 2 silicon, 1.75 to 2.25	26.75
Northern high-phosphorus foundry.....	26.75
Southern coke, No. 1 foundry and No. 1 soft silicon, 2.75 to 3.25.....	34.75
Southern coke, No. 2 foundry, silicon, 2.25 to 2.75	33.00
Southern foundry, silicon, 1.75 to 2.25.....	31.75
Malleable, not over 2.25 silicon.....	27.25
Standard Bessemer	27.95
Basic	25.75
Low phosphorus (copper free).....	48.25
Silvery, 7 per cent.....	41.15 to 41.55

Plates.—The price muddle has had a paralyzing effect on business. The mill of the leading independent is down and the outlook for new orders is not promising.

The mill quotation is 2.65c., Pittsburgh, the freight to Chicago being 27c. per 100 lb. Jobbers quote 3.67c. for plates out of stock.

Structural Material.—There has been a fair demand for small lots in the West, but business is hampered by the uncertainty regarding prices. The Warren City Tank & Boiler Co., Warren, Ohio, will fabricate 2514 tons for a refinery to be erected by the Crown Oil & Refining Co., Pasadena, Tex. The Minneapolis Steel & Machinery Co. has been awarded a contract by the Minnesota & Ontario Paper Co., International Falls, Minn., calling for 121 tons for the construction of disk evaporators. The Worden-Allen Co., Chicago, will fabricate 114 tons for a core building to be built by the Saginaw Malleable Iron Co., Saginaw, Mich.

The mill quotation is 2.45c., Pittsburgh, which takes a freight rate of 27c. per 100 lb. for Chicago delivery. Jobbers quote 3.47c. for material out of warehouse.

Bars.—New business in all kinds of bars is light. The mills making mild steel bars are running full on old orders, but the bar-iron and rail-carbon mills depend on current orders, and these are not sufficient to bring operations to anywhere near capacity.

Mill prices are: Mild steel bars, 2.35c., Pittsburgh, taking a freight rate of 27c. per 100 lb.; common bar iron, 2.50 to 2.60c., Chicago; rail carbon, 2.45c., mill. Jobbers quote 3.37c. for steel bars out of warehouse.

Sheets.—A producer which was operating full a week ago now has only five out of 18 mills running. Business which was expected as a result of the price reductions has not materialized.

Jobbers quote Chicago delivery out of stock: No. 10 blue annealed, 4.57c.; No. 28 black, 5.37c., and No. 28 galvanized, 6.72c.

Mill quotations are 4.35c. for No. 28 black; 3.55c. for No. 10 blue annealed, and 5.70c. for No. 28 galvanized.

Wire Products.—The mills report a continuation of the activity which commenced last week following the price reductions. It is believed demand would be greater were it not for the hitch in the price reduction program, but despite the upset certain requirements of the season must be met. For prices see finished iron and steel, f.o.b. Pittsburgh, page 986.

Rails and Track Supplies.—More business is being done in track specialties of all kinds, but in general the volume of orders is not large. A maker of iron tie-plates reports some business, but largely for replacement purposes.

Standard railroad spikes, 3.35c., Pittsburgh. Track bolts with square nuts, 4.35c., Pittsburgh. Steel tie plates and angle bars, 2.75c., Pittsburgh and Chicago; tie plates, iron, 2.75c., f.o.b. makers' mills. Light rails, 2.45c., f.o.b. makers' mills, with usual extras.

Cast-Iron Pipe.—Virginia, Minn., will take bids today on 250 tons for a municipal heating plant. Chicago has tentatively awarded 650 tons to a number

of contractors. Saginaw, Mich., which took bids on 350 tons on March 25, contemplates readvertising.

We quote per net ton f.o.b. Chicago, ex-war tax, as follows: Water pipe, 4-in., \$59.80; 6-in. and larger, \$56.80; class A and gas pipe, \$1 extra.

Bolts and Nuts.—Increased business, which developed as a result of price reductions, continues, but makers are doubtful whether it will last, in view of the questionable status of the Industrial Board's prices. The jobbers have revised some of their quotations. For mill prices see finished iron and steel f.o.b. Pittsburgh, page 986. Jobbers quote:

Structural rivets, 4.77c.; boiler rivets, 4.72c.; machine bolts up to $\frac{3}{4}$ x 4 in., 50 per cent off; larger sizes, 40 off; carriage bolts up to $\frac{3}{4}$ x 6 in., 40 and 10 off; larger sizes, 35 off; hot pressed nuts, square, tapped, \$1.73 off; hexagon tapped, \$1.73 off; coach or lag screw, gimlet points, square heads, 50 and 10 per cent off. Quantity extras for nuts are canceled.

Old Material.—The market is dormant so far as consumers are concerned, but dealers continue to buy for speculative reasons. The two largest local interests are reported to be willing to place large tonnages of heavy melting steel if they can secure it at \$16. So far dealers have not shown an inclination to sell at that figure. Steel scrap in general is strong, as is cast scrap. There is little interest in rolling mill grades because of the lack of demand for bar iron. There has been no particular buying by rerolling mills. Railroad offerings include average lists from the Wabash, the Santa Fe, Burlington, Union Pacific, Great Northern and Soo Line, and a small list from the Baltimore & Ohio.

We quote delivery in buyers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Iron rails	\$22.00 to \$23.00
Relaxing rails	40.00 to 45.00
Car wheels	21.00 to 22.00
Steel rails, rerolling	17.00 to 17.50
Steel rails, less than 3 ft.	17.50 to 18.00
Heavy melting steel	16.50 to 17.00
Frogs, switches and guards cut apart	16.00 to 16.50
Shoveling steel	15.50 to 16.00

Per Net Ton

Iron angles and splice bars	\$19.00 to \$20.00
Steel angle bars	15.00 to 15.50
Iron arch bars and transoms	22.50 to 23.50
Iron car axles	28.00 to 29.00
Steel car axles	23.50 to 24.50
No 1 busheling	14.00 to 14.50
No 2 busheling	9.50 to 10.00
Cut forge	14.50 to 15.00
Pipes and flues	12.50 to 13.00
No 1 railroad wrought	16.00 to 16.50
No 2 railroad wrought	14.50 to 15.00
Steel knuckles and couplers	17.50 to 18.00
Coil springs	18.50 to 19.00
No 1 cast	22.00 to 22.50
Roller punchings	18.00 to 19.00
Locomotive tires, smooth	17.50 to 18.00
Machine shop turnings	6.00 to 7.00
Cast borings	9.25 to 9.75
Stove plate and light cast	16.00 to 16.50
Grate bars	15.25 to 15.75
Brake shoes	14.00 to 14.50
Railroad malleable	15.50 to 16.50
Agricultural malleable	15.00 to 15.50
Country mixed	11.00 to 12.00

Philadelphia

PHILADELPHIA, April 8.

The slight improvement in demand for steel products, which was apparent a week ago as a result of the new prices, has been halted as a result of the action of the Director General of Railroads in refusing to accept these prices as a basis for railroad purchases. Among the steel companies there is apparently very little hope that the Washington situation will be satisfactorily adjusted. The steel companies are in a waiting attitude, but some of the pig iron sellers take the view that a free market is already here and that they are no longer bound up by the action on prices taken at Washington.

Pig Iron.—An open market for pig iron, with lower prices, is expected by sellers as a result of the turn of affairs in Washington over steel prices. The pig iron trade holds that it no longer is bound by the agreement with the Industrial Board of the Department of Commerce and it will make its own prices. All eastern

Pennsylvania furnaces are quoting on a Pittsburgh basis, but it is not believed that this will long be maintained in a free market, especially in view of the fact that western Pennsylvania furnaces, with a \$2.80 freight rate to Philadelphia, are quoting on the basis of \$26.75 f.o.b. furnace for No. 2 plain iron. In all probability Virginia furnaces will make no further pretence of quoting on a Birmingham basis, but will make whatever prices are necessary to meet competition. Many consumers are insisting on revision of their contracts to meet the \$4.25 reduction, but the Washington imbroglio has strengthened the resolve of some makers to make no such revision. They fear that to do so would establish a precedent that consumers would assume entitled them to price revision on every change of the market downward. At any rate, nothing will be done until the Washington situation is smoothed out. A few sellers believe that the final outcome will be a general revision of contracts, though some furnaces have not revised on the \$3 reduction which became effective Jan. 1. At least two makers of low phosphorus iron have granted the \$4.25 reduction on contracts. We quote standard grades of iron for delivery in Philadelphia or vicinity, except low phosphorus iron, which in quoted f.o.b. furnace.

Eastern Penna. No. 2 X (2.25 to 2.75 sil.)	\$31.90
Eastern Penna. No. 2 plain (1.75 to 2.25 sil.)	30.65
Virginia No. 2 X (2.25 to 2.75 sil.)	31.90
Virginia No. 2 plain (1.75 to 2.25 sil.)	30.65
Basic	29.65
Gray forge	29.65
Standard low phosphorus (f.o.b. furnace)	46.75
Copper-bearing low phosphorus (f.o.b. furnace)	43.75

Ferroalloys.—Restrictions on shipments of British ferromanganese for new sales have been withdrawn and the imported alloy is being offered at \$150 for the 78 to 82 per cent, which is also the price quoted by domestic producers. No business is being done. Spiegeleisen, 18 to 22 per cent, in quoted at around \$40, furnace, though in some cases freight is allowed. Two lots of British ferromanganese were received at this port last week, one of 1272 tons, valued at \$209,872, and another of 39½ tons, valued at \$6484. A shipment of Brazilian manganese ore of 3350 tons, valued at \$29,941, was also received.

Billets.—An exporter reports a transaction involving 10,000 tons of billets, deliveries to be made over several months, in which the steel company guaranteed the price against decline. The local market shows no signs of life. We quote open-hearth rerolling billets at \$42.50, Philadelphia.

Bar Iron.—Eastern bar iron rolling mills have reduced puddlers' wages from \$12.75 to \$9.25 a ton, based on the new price of 2.35c., base, Pittsburgh, for bar iron, i.e. a lb. more being quoted for bars made from puddled iron. Most of the mills have very little business and are working at about 50 per cent. We quote bar iron for delivery in the Philadelphia district at 2.595c.

Finished Steel.—The market is inactive, both buyers and sellers awaiting the outcome of the muddle in Washington over prices. While a free market for steel products is expected by some to be the result, none of the steel companies has adopted any new policy and the agreed prices are being quoted on such small inquiries as are coming into the market. Prospects for a partial resumption of building activity had become fairly good a week ago, but structural steel companies expect that such projects will be held up pending further developments. Plate mills are taking almost no business, and one of the large Eastern plate-making plants is below 50 per cent operation. A fair business is being done in steel bars. We quote Philadelphia delivered prices on steel products as follows: Plates, 2.895c.; plain material, 2.695c.; steel bars, 2.595c.; No. 10 blue annealed sheets, 3.795c.; No. 28 black sheets, 4.595c.; No. 28 galvanized sheets, 5.945c.

Old Material.—In view of the situation in Washington in regard to steel prices, some dealers believe that the bullish movement in scrap was overdone. It was engineered very largely by a leading New York dealer, who is credited with having foreseen a much improved demand from the mills as a result of the adoption of

reduced steel prices. The action of the Director General of Railroads in refusing to accept the new prices has caused a slight revision of sentiment, but this is believed to be but momentary, as most dealers and sellers of scrap are holding their material at higher prices than the mills are at present disposed to pay. A significant indication of the underlying strength of the market was the bids received by the Pennsylvania Railroad on about 1500 tons of heavy melting steel, none of these bids having been below \$17 delivered. The War Department is reported to have sold 10,000 tons of shell forgings to a steel plant at \$16.50, delivered. We quote for delivery at consumers works, eastern Pennsylvania, as follows:

No. 1 heavy melting steel.....	\$15.50 to \$16.50
Steel rails, rerolling.....	17.50 to 18.00
No. 1 low phosphorus, heavy, 0.04 and under.....	22.50 to 23.00
Iron rails.....	20.00 to 22.00
Carwheels.....	24.00 to 25.00
No. 1 railroad wrought.....	22.00 to 23.00
No. 1 yard wrought.....	20.00 to 21.00
Country yard wrought.....	12.00 to 15.00
No. 1 forge fire.....	12.00 to 13.00
Bundled skeleton.....	12.00 to 13.00
No. 1 busheling.....	15.00 to 16.00
No. 2 busheling.....	13.00 to 14.00
Turnings (short shoveling grade for blast furnace use).....	11.50 to 12.50
Mixed borings and turnings (for blast furnace use).....	9.50 to 10.50
Machine-shop turnings (for rolling mill use).....	12.50 to 13.00
Cast borings (clean).....	13.50 to 14.00
No. 1 cast.....	22.00 to 23.00
Grate bars.....	18.00 to 19.00
Stove plate.....	18.00 to 19.00
Railroad malleable.....	18.00 to 19.00
Wrought iron and soft steel pipes and tubes (new specifications).....	18.50 to 19.00
Ungraded pipe.....	13.00 to 14.00

Cleveland

CLEVELAND, April 8.

Iron Ore.—Some ore reservations were made during the week, but no actual contracts are reported, and it is doubtful whether consumers will be willing to do any buying until the uncertainty regarding the entire iron and steel price situation is removed. If the stabilized prices recently adopted do not hold, a readjustment of ore prices is not improbable. Some of the ore firms plan to start their boats next week and would like to have orders on which to begin shipments. Ore men are now calling on their trade and hope to line up some tonnage this week. Ore shipments from docks during March were 1,208,002 tons, as compared with 1,651,564 tons during the preceding March. Shipments to the furnaces for the season were 39,791,966 tons as compared with 38,236,583 tons during the same period last year and docks were in better shape on April 1 than a year ago. The amount of ore on docks April 1 was 6,518,047 tons, as compared with 7,841,788 tons on the corresponding date in 1918. We quote, f.o.b., lower Lake ports, as follows:

Old range Bessemer, \$6.65; old range non-Bessemer, \$5.90; Mesaba Bessemer, \$6.40; Mesaba non-Bessemer, \$5.75.

Pig Iron.—The pig iron market is in a very unsettled state because of the possibility that the price arrangements made recently with the Government will fall through as a result of the refusal of the Railroad Administration to place orders at the new "stabilized" prices. Closely allied with this question as to whether the new prices will hold is that relating to revision of old contracts to the present prices. One important Cleveland interest has taken the stand that if the present "stabilized" prices were made by an authorized Government agency, it will revise its contracts. Meantime, it is awaiting developments in Washington. The revision of contracts was the important subject discussed at a meeting of pig iron producers held in Cleveland, April 2. Sentiment was divided between holding to old contracts or revising these to new prices. In view of the action of a large Chicago interest in revising contracts, some sellers felt that they would be at a disadvantage, were they not to revise contracts, and that it would be hard to get buyers to take their iron,

but others stood out firmly against revision. However, action was deferred pending the outcome of the stand taken by the Railroad Administrator. An important local development of the week was a decision by Cleveland blast furnaces to sell pig iron on a Cleveland instead of a Valley basis, and these furnaces are now quoting the regular price, f.o.b. Cleveland. Cleveland producers adopted the Valley basing point after the recent reduction in prices, which meant a price advance of \$1 a ton to the consumer over the regular price with Cleveland as a basing point, this being the difference between the local switching rate and the freight rate from Valley points. Leading Cleveland foundrymen protested emphatically against the Valley basing point, contending that with the higher priced pig iron they would be at a disadvantage in competition with Chicago and Detroit foundries where considerable of their product goes. Although the recently named prices may not hold, sellers in this territory are continuing to quote these prices. There was some improvement in the volume of inquiry and number of orders during the week in spite of the unsettled price situation in Washington. Sales were made in Cleveland and vicinity aggregating 5,000 tons, and one seller booked orders, largely in the Michigan and Indiana territory, for 7500 tons in lots up to 2000 tons. With the exception of a little malleable iron, these orders were all for foundry iron and came directly or indirectly from the automobile industry and were mostly for the second quarter delivery, although one contract was taken for the last half. Included in the sale was 750 tons of silvery iron. We quote delivered Cleveland, as follows:

Bessemer.....	\$29.35
Basic.....	26.15
Northern No. 2 foundry.....	27.15
Southern No. 2 foundry, silicon 2.25 to 2.75.....	33.00
Gray forge.....	26.15
Ohio silvery.....	42.65
Standard low phos., Valley furnace.....	45.75

Coke.—Some of the producers of Connellsville foundry coke have revised prices to \$5.50 for standard makes of Connellsville foundry coke for April shipment. Best makes are quoted at from \$5.25 to \$5.75 per net ton at oven. There is very little new demand.

Bolts, Nuts and Rivets.—Following the fair volume of business that had been held up previous to the price readjustments and which has since come out, the bolt and nut market is rather quiet. The demand for rivets is fair, being, however, about wholly in specifications on old contracts. New bolt, nut and rivet prices are being maintained.

Finished Iron and Steel.—The buying of steel has been checked to a considerable extent by the refusal of the Railroad Administration to accept the new prices. Some business that was about to be placed, including a round tonnage of semi-finished steel, has been held up, and in a few cases buyers of finished steel have ordered shipments suspended. On the other hand, some consumers, particularly in the automobile field, are going ahead and placing orders freely for second quarter shipment for use in third quarter production. They apparently feel that should there be any further decline in prices they will be given the benefit, as they were after the recent reductions. Generally, however, buyers are marking time, awaiting a clearing up of the situation that has developed in Washington, and outside of the automobile field the demand is limited to small lots for early requirements. The steel trade generally is optimistic and does not look for lower prices should the price stabilizing plan fail. Some of the implement manufacturers who are now paying regular prices are sounding the market to see if they can secure any concessions. This trade is also asking for a readjustment in prices on various steel specialties used in making farm implements, which were not changed when other prices were reduced. Hard steel prices are being shaded \$2 a ton in this territory by one mill that is quoting 2.25c. for both angles and reinforcing bars. Some mills are shading prices on blue annealed sheets by quoting No. 8 to 12 gages, inclusive, on the plate basis. No. 10 sheets are being quoted at 20 per cent above the plate prices, or 3.18c., as com-

pared with the regular 3.55c. price. There is a lack of uniformity in quotations on other gages. Jobbers' prices are as follows:

Steel bars, 3.27c.; plates, 3.57c.; structural shapes, 3.87c.; bands and hoops, 3.97c.; No. 10 blue annealed sheets, 4.47c.; No. 28 black sheets, 5.27c.; No. 28 galvanized sheets, 6.62c.

Tool Steel.—Leading makers have again reduced prices 5c. a pound on high speed tool steel, which is now quoted at \$1.70 per lb. base. The market is still flooded with resale tool steel and it is reported that this is being offered as low as \$1.10.

Old Material.—Owing largely to speculative buying, the local scrap market was in an excited condition several days last week, but has fallen back to near its former level with prices about where they were before the flurry, with the exception of borings and turnings, which are still somewhat higher. The activity was almost entirely between dealers, and was doubtless stimulated to some extent by the heavy purchases of borings and turnings by a Western Pennsylvania mill. Sales of these grades were reported as high as \$14 for borings and \$13 for turnings for Brackenridge delivery. Dealers were talking \$20 for heavy melting steel and forced prices up sharply on this grade, sales being reported as high as \$17 to \$17.50. A decline, however, came nearly as rapidly as the advance, and it is said that turnings can now be purchased for Western Pennsylvania delivery at around \$11, and borings at around \$12, or \$2 per ton lower than a few days ago. Heavy melting steel can be purchased to-day for Northern Ohio delivery at around \$16. The easing off in prices is doubtless to some extent, but not wholly, due to the uncertainty in the steel market because of the refusal of the Railroad Administration to accept the new iron and steel prices. There is very little demand from consumers in this territory, although mills will take on small lots of scrap when prices are attractive. We quote delivered consumers' yards in Cleveland and vicinity, as follows:

Heavy melting steel.....	\$15.00 to	15.50
Steel rails, under 3 ft.....	17.00 to	19.00
Steel rails, rerolling.....	15.50 to	16.00
Iron rails.....	23.00 to	24.00
Iron car axles.....	29.50 to	30.00
Steel car axles.....	27.50 to	28.50
Low phosphorus melting scrap.....	16.25 to	17.00
Cast borings.....	9.75 to	10.25
Iron and steel turnings and drillings.....	8.50 to	9.00
Compressed steel.....	13.50 to	13.75
No. 1 railroad wrought.....	17.00 to	17.50
Cast iron car wheels.....	22.00 to	22.50
Agricultural malleable.....	14.00 to	15.00
Railroad malleable.....	17.00 to	17.50
Steel axle turnings.....	13.00 to	13.50
Light bundled sheet scrap.....	10.00 to	11.00
No. 1 cast.....	22.00 to	23.00
No. 1 busheling.....	14.50 to	15.00
Drop forge flashings, 10 in. and under.....	13.75 to	14.25
Drop forge flashings, over 10 in.....	10.50 to	10.75
Railroad grate bars.....	16.00 to	16.50
Stove plate.....	16.75 to	17.50

British Iron and Steel Market

Hesitation Until End of Government Control
April 30—Higher Prices Expected

(By Cable)

LONDON, ENGLAND, April 8.

Signs of improvement are developing all around. Large pig-iron inquiries remain unfilled and hesitation is still apparent pending the removal of subsidies on April 30. It is then expected that home prices will increase fully 50s. [which is roughly the spread now between domestic and export prices].

Tin plate bars are expected to advance £2 May 1, which would raise tin plates to a basis of 36s.

A central selling agency is still discussed, but nothing is settled. Steel price advances are regarded as inevitable. The fuel position has improved.

Following are the Government fixed prices per gross ton, except where otherwise stated, f.o.b. makers'

works, with American equivalents figured at \$4.66 for £1, tin plate, however, not being under control:

Pig iron:	Domestic			Export				
	£	s.	d.	£	s.	d.		
East Coast Bessemer....	6	2	6	\$28.55	8	12	6	\$40.20
West Coast Bessemer....	6	7	6	29.71	8	17	6	41.36
Malleable Bessemer....	6	17	6	31.92	9	7	6	43.57
Cleveland No. 3 foundry....	4	15	0	22.13	7	5	0	33.78
Cleveland forge.....	4	15	0	22.13	7	5	0	33.78
Scottish No. 3 foundry....	5	14	0	26.56	8	4	0	38.21
Cleveland basic.....	5	0	0	23.30	7	10	0	34.95
Coke (Durham):								
Furnace	1	13	0	-----	-----	-----	-----	
Foundry	1	18	0	-----	-----	-----	-----	
Ferromanganese	25	0	0	-----	30	0	0	-----
Billets and slabs:								
Rolling	12	5	0	57.08	13	10	0	62.91
Forging	13	7	6	62.33	15	0	0	69.90
Tin plate bars.....	12	5	2	57.12	12	17	6	60.00
Rails, 60 lb. and upward....	13	7	6	62.33	15	10	0	72.23
Steel bars.....	16	10	0	76.89	18	10	0	86.21
Large rounds, etc.....	14	5	0	66.40	17	10	0	81.55
Structural material	13	12	6	63.50	16	2	6	75.15
Plates	14	0	0	65.24	16	10	0	76.89
Plates, thin	16	0	0	74.56	19	10	0	90.87
Plates, boiler	15	0	0	69.90	17	10	0	81.55
Bar iron	17	15	0	82.71	20	0	0	93.20
Tin plates, 14 x 20 coke....	33	10	1/2	7.90	-----	-----	-----	-----
112 sheets, 108 lb., f.o.b. Wales	-----	-----	-----	-----	-----	-----	-----	-----

New York

NEW YORK, April 8.

Pig Iron.—The market drags and not enough business has developed to test prices, but some sellers are quietly making concessions of from 50c. to \$1 per ton, although malleable is stronger than basic or foundry grades. There is little discussion in regard to revising contracts, as buyers can not claim there is a new Government price when there is no certainty as to prices. Inquiries for export continue to float about and some of them are identified as old inquiries which have reappeared, including some for very large tonnages. An example is an inquiry for a round tonnage for Belgium which was in this market about a month ago, and has recently come back by way of a Western office. It is generally conceded that under present conditions exporting is practically impossible. It is realized that as long as England has any iron to send to European buyers there will be no opportunity for American furnaces to export to European countries, but it is realized that England's supply is not large. If anything were needed to make impossible the establishment of the Pittsburgh basing method, it has been furnished by the announcement that, effective April 18, freight rates from Pittsburgh to Newark, Dover, Paterson, Passaic and Harrison will be advanced from the present rate of \$2.60 to \$4.30, while the rate from Pittsburgh to Jersey City, now \$3, will be raised to \$4.30. We quote as follows, delivered New York, for Northern and Southern grades:

No. 1 foundry, silicon, 2.75 to 3.25.....	\$31.55
No. 2 X, silicon, 2.25 to 2.75.....	29.80
No. 2 plain, silicon, 1.75 to 2.25.....	28.55
No. 2 X, Virginia, silicon, 2.25 to 2.75.....	32.40
No. 1 Southern silicon, 2.75 to 3.25.....	37.45
No. 2 Southern, soft (all rail), sil., 2.25 to 2.75.....	35.70
No. 2 Southern (all rail), sil., 1.75 to 2.25.....	34.45

Ferroalloys.—Transactions in domestic ferromanganese continue to be confined to sales of carload lots for spot or early delivery, mostly at \$150 delivered for 78 to 82 per cent alloy, with \$2 per unit deducted under 78 per cent. It is stated that resale alloy has sold in the last week at \$115 delivered, but it is believed that most of the resale metal available has been absorbed. There are rumors that some of the British alloy bought before the war at very low prices and now being imported is being resold even at the low figure above mentioned at a substantial profit. A surprising factor in the entire situation is the continued large American production of ferromanganese. The March output, according to the blast furnace report of THE IRON AGE was about 20,000 tons, making the total for the first quarter of this year about 63,000 tons, which with the 20,000 to 25,000 tons of British alloy now being imported on contracts made before April 6, 1917, makes the supply very large. There is very little demand for spiegel-eisen, sales being confined to carload lots at the prevailing quotation of \$40, delivered, for the 16 to 19 per

cent alloy and \$45 for the higher analyses. Ferro-silicon, 50 per cent, is in light demand, and is obtainable as low as \$90 on contract or for early delivery.

Cast-Iron Pipe.—The cast-iron pipe business is at a standstill, owing to the uncertainty concerning pig iron and the general unwillingness of municipalities to come into the market at the present time. New York quotations are as follows: 6-in. and heavier, \$57.70; 4-in., \$60.70; 3-in., \$67.70, and \$1 additional for class A and gas pipe.

Finished Iron and Steel.—There is a wide view that as the Railroad Administration has repudiated the new prices the steel trade is not bound by them. Buyers naturally look for lower prices and state that no real buying movement will begin until steel prices are sharply cut. Their further prediction is that at that price buying would be done in sufficient volume to lift the market up again. With the exception of a few structural jobs the market is in a waiting attitude, and in at least one instance a fabricating concern, in placing orders for over 3000 tons of plates and shapes insisted on protection against any decline in price before the steel is shipped, and the mills agreed to this condition. The plates were let at 2.65c. and the shapes at 2.45c., Pittsburgh. Bids were closed in Washington Monday for 6000 tons of structural steel for an addition to the Mare Island Navy Yard. The Levering & Garrigues Co. has received the contract for the Pictorial Review Building, New York, involving about 3100 tons. The Hershey Chocolate Co., Hershey, Pa., has awarded a contract to Lewis F. Shoemaker & Co. for a building which will take 1600 tons. The Willys-Morrow Mfg. Co., Elmira, N. Y., has let a 700-ton building to the Jones & Laughlin Steel Co. The Reading Steel Casting Co., Reading, Pa., has contracted for a new machine shop, involving 250 tons. The New York Municipal Railway is in the market for 600 tons for a terminal at Coney Island. J. J. Lannin is getting bids on a hotel building, which may be built on Seventh Avenue, New York, and there are several downtown office buildings in prospect, but nothing definite has developed on these projects. The American Locomotive Co. has received orders from the South Manchuria Railways of China for 28 decapod locomotives and from the Kaijima Mining Co., China, for two six-wheel switching engines. We quote mill shipments as follows: Bar iron, refined grade, 2.62c.; double refined bar iron, 3.62c.; soft steel bars, 2.62c.; shapes, 2.72c.; plates, 2.92c., all New York.

Warehouse Business.—Jobbers report that whatever benefit was about to materialize from the stabilizing effect of the recent price revision has been dissipated by the action of the director-general of the railroads in discarding it. The net result has been to lower prices without stimulating business. While out-of-store prices are quoted unchanged as a whole from the week previous, price levels are unstable and varying quotations have been noted. The only going business is for day-to-day needs. Warehouses generally are chock full. The market on sheets is still badly unsettled; No. 28 box annealed black sheets, for example, being offered anywhere from 5.25c. per lb. to 5.75c. Spring steel has been reduced ½c. to 6.50c. per lb., although one offer is reported at 4.50c., presumably on new stock. Out-of-store prices are: No. 10 blue annealed sheets, 4.55c. to 4.57c.; No. 28 black sheets, cold-rolled one pass, 5.50c. to 5.70c.; No. 28 galvanized sheets, 6.50c. to 6.70c.; steel bars, 3.37c.; structural shapes, 3.47c.; plates, 3.67c.; bands, 3/16-in., Nos. 10 and 12, 4.07c.; shafting, net list.

Old Material.—The refusal of the Railroad Administration to recognize the recently established prices of the steel makers has seemingly caused a curtailment of buying of scrap, with an attendant subsiding of the recent wave of optimism. The chief grade changing hands is turnings for blast furnace use. Prices are practically the same as a week ago. Scrap dealers are wondering as to the outcome in case makers of semi-finished and finished steel again lower prices as a result of the present controversy. As labor costs and freight rates appear stable, it is believed that manufacturers will try to lower their costs by paying less for scrap.

However, dealers generally say they will hold rather than sell at lower prices. Prices which brokers are quoting dealers, New York, follow:

Heavy melting steel.....	\$12.00 to \$12.50
Re-rolling rails.....	14.50 to 15.00
Relaying rails, nominal.....	38.00 to 40.00
Steel car axles.....	19.00 to 20.00
Iron car axles.....	23.00 to 24.00
No. 1 railroad wrought.....	18.50 to 19.50
Wrought iron track.....	13.00 to 14.00
Forge fire.....	8.00 to 9.00
No. 1 yard wrought, long.....	15.00 to 15.50
Light iron.....	6.00 to 6.50
Cast borings (clean).....	10.00 to 10.50
Machine shop turnings.....	8.50 to 9.00
Mixed borings and turnings.....	7.50 to 8.00
Iron and steel pipe (1 in. minimum diameter), not under 2 ft. long....	14.50 to 15.00
Stove plate.....	16.50 to 17.50
Locomotive grate bars.....	15.00 to 15.50
Malleable cast (railroad).....	14.50 to 15.00
Old carwheels.....	21.00 to 21.50

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, are:

No. 1 machinery cast.....	\$22.00 to \$23.00
No. 1 heavy cast (columns, building materials, etc.), cupola size.....	21.00 to 22.00
No. 1 heavy cast, not cupola size.....	15.00 to 16.00
No. 2 cast (radiators, cast boilers, etc.).....	16.50 to 17.50

Buffalo

BUFFALO, April 7.

Pig Iron.—The volume of inquiry has dwindled to a very light aggregate and the market has become unsettled because of the price schedule agitation between the Industrial Board of the Department of Commerce and the Director General of Railroads at Washington. Buffalo furnacemen are taking the positive stand that the recently suggested prices are not retroactive. Although most furnaces report a very low amount of inquiry and buying one producer mentions having received an inquiry for 1000 tons of foundry and another the sale of 1000 tons of basic. We quote the price schedule f.o.b. furnace, Buffalo, as follows:

No. 1 foundry, 2.75 to 3.25 silicon.....	\$29.75
No. 2 X, 2.25 to 2.75 silicon.....	28.00
No. 2 plain foundry, 1.75 to 2.25 silicon.....	26.75
Gray forge.....	25.75
Malleable, silicon not over 2.25.....	27.25
Basic.....	25.75
Basic, 1 to 1½ per cent mng.....	26.25
Basic, 1½ to 2½ per cent mng.....	26.75
Bessemer.....	27.95
Lake Superior charcoal, regular grades.....	35.50

Old Material.—Inquiry in good volume continues to come in, but actual sales have not aggregated as large a tonnage as dealers had expected from the activities which seemed about to develop last week when the U. S. Steel Corporation was reported as having entered the market for a large tonnage of heavy melting steel. Sales of that commodity during the week have not been large, but many dealers still believe a genuine buying movement is not far away. The current demand for borings and turnings, low phosphorus, No. 1 railroad wrought and stove plate is good. The price for low phosphorus has advanced to \$21 to \$22; No. 1 railroad wrought to \$19 to \$19.50, and stove plate to \$18.50 to \$19. We quote dealers' asking prices as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel, regular grades.....	\$14.50 to \$15.50
Low phosphorus, 0.04 and under.....	21.00 to 22.00
No. 1 railroad wrought.....	19.00 to 19.50
No. 1 machinery cast.....	21.00 to 22.00
Iron axles.....	23.00 to 24.00
Steel axles.....	23.00 to 24.00
Carwheels.....	21.00 to 22.00
Railroad malleable.....	17.00 to 18.00
Machine shop turnings.....	8.50 to 9.50
Heavy axle turnings.....	13.00 to 14.00
Clean cast borings.....	11.00 to 12.00
Iron rails.....	21.00 to 22.00
Locomotive grate bars.....	16.00 to 17.00
Stove plate.....	18.50 to 19.00
Wrought pipe.....	13.00 to 14.00
No. 1 busheling.....	13.00 to 14.00
Bundled sheet stamping.....	11.00 to 12.00

Finished Iron and Steel.—The improvement in confidence that was manifest after the price agreement was announced two weeks ago has been halted by the an-

certainly which has developed in the Government stabilization plan. Inquiries, while somewhat more plentiful than a week ago, are principally for odd lots and small tonnages, with practically all consumers pressing for prompt delivery. One or two selling agencies report better demand in general lines as well as for the automobile trade; but as a rule buying has been light and unless the stabilization plan is speedily consummated and further controversy settled, it is feared new business will continue to lag.

Cincinnati

CINCINNATI, April 8—(By Wire).

Pig Iron.—A number of Northern furnaces have readjusted prices on the new basis and it is reported that some Southern producers contemplate taking the same step at an early date. However, the readjustment program is not yet in full swing and some concerns are not willing to change any contracts. Of course all iron sold now is on the new basis, but the tonnage disposed of is very small. It is the general opinion that the present tangled-up state of affairs is almost entirely responsible for the absence of contracting. Only a few urgently needed carloads of foundry and high silicon iron have been sold recently and the number of bona fide inquiries for forward shipment have practically reached the zero mark. The general opinion is that if all restrictions were removed, business would soon be moving along in a more satisfactory and stable way. There is no demand for basic iron, although quite a number of melters have not yet covered for their last-half requirements. Malleable iron is also not wanted.

Based on freight rates of \$3.60 from Birmingham and \$1.50 from Ironton, we quote, f.o.b. Cincinnati:

Southern coke, silicon 1.75 to 2.25 (base price).....	\$30.35
Southern coke, silicon 2.25 to 2.75 (No. 2 soft).....	31.60
Southern gray forge	29.35
Ohio silvery, 8 per cent silicon.....	42.05
Southern Ohio coke, silicon 1.75 to 2.25 (No. 2).....	28.55
Basic, Northern	27.55
Standard Southern carwheel.....	51.60

Coke.—There is very little demand for either furnace or foundry coke and practically no contract business is being done. Consumers who have not covered ahead are willing to take chances on the future believing that they can get the fuel in sufficient quantities to take care of their needs. The slowing down of foundry operations in this territory has cut off the call for prompt coke from this source, and in some cases shipments on old contracts are being held up. Nearly all foundries have comparatively large stocks on hand. New River producers have not yet cut their price, which is \$8 on both furnace and foundry. However, it is needless to say that no business is being transacted on this basis.

Finished Material.—Business in nearly all lines has fallen flat, and jobbers are taking orders for material only for prompt shipment and are selling practically nothing ahead. Neither the mills nor the jobbers are receiving any business from railroads except those covering emergency supplies. Considerable complaint has been made on account of the slowness of the railroads in paying their bills. Hardware jobbers are selling some wire nails mostly to retail country merchants on a basis of \$3.85 per keg base. The demand for both black and galvanized sheets is only fair. The mills have only comparatively small stocks on hand.

The following are present local jobbers' prices: Steel and iron bars, 2.25c. base; bands, 4.03c. base; structural shapes, 2.40c. base; plates, 1/4-in. and heavier, 3.63c. base; No. 10 blue annealed sheets, 4.53c., and wire nails, \$3.85 per keg base.

High Speed Steel.—Business is rather slow, as the machine shops are not working to full capacity by any means. A reduction of 5c on the leading brands has been made, making the new price \$1.70 per lb. base.

Fluorspar.—Some shipments have recently been held up and there is practically no new business in sight. Washed gravel fluorspar from an approximate

analysis of 85 per cent and over of calcium chloride remains at \$25 per ton at point of shipment.

Old Material.—There was a little buying spurt the first part of last week, but the market this week is at a standstill. The foundries and steel mills have large stocks of scrap on hand or contracted for, the quantity being sufficient to carry them through the second quarter, and in some cases beyond. Dealers state that they are receiving practically no inquiries and that both purchases and sales are practically confined to a prompt basis. No changes in quotations on any grades are to be noted. The following are dealers' prices in carload lots, f.o.b. yards southern Ohio and Cincinnati:

	Per Gross Ton	
Bundled sheet	\$9.00 to	\$9.50
Old iron rails	22.50 to	23.00
Relaying rails, 50 lb. and up.....	40.00 to	41.00
Re-rolling steel rails.....	14.00 to	14.50
Heavy melting steel	12.00 to	12.50
Steel rails for melting	12.50 to	13.00
Old carwheels	15.00 to	15.50
No. 1 railroad wrought.....	13.00 to	13.50
	Per Net Ton	
Cast borings	\$5.00 to	\$5.50
Steel turnings	5.00 to	5.50
Railroad cast	15.50 to	16.00
No. 1 machinery	17.00 to	17.50
Burnt scrap	11.00 to	11.50
Iron axles	23.00 to	23.50
Locomotive tires (smooth inside).....	14.00 to	14.50
Pipes and flues.....	10.50 to	11.00
Malleable cast	11.00 to	11.50
Railroad tank and sheet.....	9.00 to	9.50

St. Louis

ST. LOUIS, April 7.

Pig Iron.—The pig iron market, which showed some signs of life when the adjustment of prices was announced, suffered something of a set back as a result of the announcement that the Railroad Administration would not buy at the figures set. There had been some inquiry in the market, but this failed to materialize in business and this was ascribed to the attitude of Director General Hines. There is, therefore, a disposition to wait a while longer before making any contracts and in consequence the buying done during the week was in small lots for immediate needs. The fixing of general prices for the country also has a special bearing in this market because of its location and the sources from which its pig iron comes. Northern iron, from Chicago and vicinity commands the announced price plus \$2 freight rate to St. Louis. The local furnace is ready to sell at the announced figure plus \$2 to compete with Chicago, while Birmingham and Southern iron generally with the announced price has also a freight rate into St. Louis of \$4.30. In consequence Southern pig iron is dependent upon market developments which will create a demand enabling the Southern furnaces to have a differential which will permit them to compete here.

Coke.—No business appeared in coke, there being no immediate need on the part of consumers for fuel, inasmuch as their supplies are still sufficient to meet any current demand.

Finished Iron and Steel.—In finished products, both mills and warehouses felt the effect of the uncertainty created by the latest development at Washington and there was in consequence a renewed hesitancy on the part of the buyers, though both mills and warehouses report that there is some increase in activity on the part of the consumers, though increases are not as yet large. For the stock out of warehouse we quote as follows:

Soft steel bars, 3.44c.; iron bars, 3.44c.; structural material, 3.54c.; tank plates, 3.74c.; No. 8 blue annealed sheets, 4.59c.; No. 10 blue annealed sheets, 4.64c.; No. 28 black sheets, cold rolled, one pass, 5.44c.; No. 28 galvanized sheets, black sheet gage, 6.79c.

Old Material.—The smaller dealers in scrap have been showing some activity during the past week and in consequence some small lists which came out went at rather higher prices. The larger dealers are holding off, however, having been made cautious by the announcement that the Steel Corporation had withdrawn from the scrap market in Chicago and Pittsburgh. The opinion seemed to be that the small dealers were short of material and had to buy to protect themselves, or

else that they were gambling on a stiffening of prices and were endeavoring to get in on the supplies ahead of time. The lists out included 1,200 tons from the Wabash, 350 tons from the Cotton Belt and 900 tons from the Terminal Railroad Association.

Per Gross Ton	
Old iron rails	\$22.00 to \$23.00
Old steel rails, rerolling	16.00 to 17.00
Old steel rails, less than 3 ft.	16.50 to 17.00
Relaying rails, standard sections, subject to inspection	40.00 to 45.00
Old carwheels	22.00 to 22.50
No. 1 railroad heavy melting steel	15.00 to 15.50
Heavy shoveling steel	14.00 to 14.50
Ordinary shoveling steel	13.00 to 13.50
Frogs, switches and guards, cut apart	15.00 to 15.50
Ordinary bundled sheets, scrap	9.00 to 9.50
Heavy axle and tire turnings	8.00 to 8.50
Per Net Ton	
Iron angle bars	\$16.00 to \$16.50
Steel angle bars	15.00 to 15.50
Iron car axles	24.00 to 24.50
Steel car axles	23.00 to 23.50
Wrought arch bars and transoms	19.00 to 19.50
No. 1 railroad wrought	15.00 to 15.50
No. 2 railroad wrought	14.00 to 14.50
Railroad springs	15.50 to 16.00
Steel couplers and knuckles	15.50 to 16.00
Locomotive tires, 42 in. and over, smooth inside	14.00 to 14.50
No. 1 dealers' forge	11.50 to 12.00
Cast iron borings	8.00 to 8.50
No. 1 busheling	13.50 to 14.00
No. 1 boilers cut to sheets and rings	8.00 to 8.50
No. 1 railroad cast	20.00 to 20.50
Stove plate and light cast	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Agricultural malleable	11.00 to 11.50
Pipes and flues	11.00 to 11.50
Heavy railroad sheet and tank	10.00 to 10.50
Railroad grate bars	12.00 to 12.50
Machine shop turnings	6.50 to 7.00
Country mixed	11.00 to 11.50
Uncut railroad mixed	12.50 to 13.00
Horseshoes	14.50 to 15.00

San Francisco

SAN FRANCISCO, March 25.

The interest of the iron and steel trade shifted temporarily from the labor situation to prices this week. The announcement that the Industrial Board, in connection with the American Iron and Steel Institute, had agreed upon reductions on pig iron and steel products caused considerable comment. If prices remain unchanged for the rest of the year, it is generally believed that the immediate result will be a quickening of business notwithstanding the unsettled condition of labor. On the other hand, it is thought that if no assurance is given that the price is to remain unchanged for a considerable period the cut will have little effect on stabilizing business. Immediately on the receipt of the news of the change the jobbers began to readjust all their prices to agree with the new ruling, and they are now offering their stock at these new prices. The price of cast iron pipe has been reduced \$5, which is probably enough to start a number of improvements held up on account of prices. The labor situation has not changed materially.

Finished Material.—Under the new prices a lively demand for reinforcing bars is anticipated as soon as other building materials are reduced somewhat. Structurals also are awaiting the reduction in other building materials before showing a real activity. Both plates and sheets have been moving very slowly, but with the new prices more activity is looked for.

Pipe.—A large demand for wrought pipe in the oil region is expected to develop as soon as it becomes generally known that prices have been reduced. Very little buying, but a considerable inquiry, has been the recent development in cast-iron pipe. It is believed that the \$5 reduction will turn these inquiries into orders, especially if municipalities and public service corporations are assured that there is no chance of further reduction in the near future.

Pig Iron.—The cut in the price of pig iron is not of much interest locally except in so far as it permits a lower price on other materials. The users of pig iron

are said to be well supplied and the lower price will not stimulate much buying on the Coast.

Coke.—With the restriction of the output in the foundries due to the falling off of orders on account of the strike, the supply of coke in this market is ample and stocks are being accumulated.

Old Materials.—Scrap is very soft. The best the mills are offering for steel scrap is \$18 per long ton and they are taking only enough to meet with their immediate requirements, which are far below the normal. It is reported here that there are large quantities of steel scrap at Portland and Seattle, where it is held at about \$12 per ton. Cast-iron scrap is now selling in limited quantities at \$37 to \$38 per net ton. It is reported that one foundry recently bought 500 tons of carwheels at \$28 per long ton, delivered.

IRON AND INDUSTRIAL STOCKS

Market Strong on Peace Prospects—Steel Shares Active and Firm—Heavy Sales

NEW YORK, April 8.

The market has been largely swayed in the past week by developments, or rather the lack of developments in Paris. The belief has been generally firm, however, that some kind of peace is near. As a result, nearly all stocks have been strong and some have made important and large advances, attaining new high ground for the year. This is particularly true of the specialties. The steel stocks have all ruled firm and steady, with Steel common ranging close to 99 and not going higher than par. The copper stocks have all been firm with a gradual advance in most of them. The largest turnover of the year took place on Tuesday, this week, when over 1,275,000 shares changed hands.

The range of prices in active iron and industrial stocks from Tuesday of last week to Wednesday of this week was as follows:

Allis-Chalm. com.	35 3/4 - 37 1/2	La Belle Iron c.	97 - 100
Allis-Chalm. pf.	89 - 90 1/4	Lackaw. Steel	70 - 71 1/4
Am. Can. com.	49 1/4 - 51 3/4	Lake Supr. Corp.	19 1/2 - 20
Am. Can. pf.	100 3/4 - 101 1/2	Lima Loco.	35 - 35 1/2
Am. Car & F. c.	89 3/4 - 93 3/4	Midvale Steel	44 1/2 - 46 1/2
Am. Car & F. pf.	115 1/2 - 116	Nat.-Acme	37 1/2 - 39 1/2
Am. Loco. com.	65 1/4 - 67 3/8	Nat. En. & St. c.	52 3/4 - 58
Am. Loco. pf.	103 - 103 1/2	N. Y. Air Brake	108 1/2 - 111 1/2
Am. Radiator c.	28 1/2 - 28 7/8	Pittsburgh Steel pf.	93 - 93 1/2
Am. Ship com.	107 1/4 - 110	Pressed Steel c.	68 - 70 1/2
Am. Steel Edries.	79 1/2 - 81 1/4	Ry. Steel Spg. c.	77 1/2 - 81 1/2
Bald. Loco. com.	87 1/4 - 90 1/4	Ry. Steel Spg. pf.	107 1/2 - 108 1/2
Beth. Steel com.	68 3/4 - 72 1/2	Republic com.	81 1/2 - 83 1/2
Beth. Steel cl. B.	68 3/4 - 73 1/4	Republic pf.	101 1/2 - 102 1/2
Case, J. I. pf.	95 - 97 1/4	Sloss com.	52 - 54
Central Fdry. pf.	27 - 30 1/2	Sloss pf.	88 - 89 1/2
Chic. Pneu. Tool.	64 1/2 - 65	Superior Steel	39 1/2 - 41
Colo. Fuel	41 1/2 - 44 1/2	Transue-Williams	42 1/2 - 45
Crucible Steel c.	65 1/2 - 67 1/2	Un. Alloy Steel.	43 1/2 - 45
Crucible Steel pf.	93 - 94 1/4	U. S. Pipe com.	50 - 52 1/2
Deere & Co. pf.	97 1/2 - 98	U. S. Pipe pf.	55 - 58
Gt. No. Ore Cert.	155 3/4 - 160 3/4	U. S. Steel com.	97 1/2 - 100
Gulf States Steel.	41 - 43	U. S. Steel pf.	115 - 117 1/2
Gulf S. Stl. 1st pf.	54 1/2 - 55 1/2	Va. L. C. & Coke	57 - 58
Int. Har. com.	124 - 128 1/4	Westingh. Elec.	45 1/2 - 47 1/2
Int. Har. pf.	116 - 117 1/4		

Dividends

The Carbon Steel Co. quarterly, 2 per cent and extra 2 per cent on the common, payable April 15.

The Midvale Steel & Ordnance Co., quarterly, \$1, payable May 1.

The Steel Products Co., quarterly, 3 per cent on the common, payable April 19.

The United Alloy Steel Corporation, quarterly, \$1, payable April 19.

Savage Arms Corporation Affairs

President A. E. Borie, in a statement to the stockholders of the Savage Arms Corporation, dated April 5, refers to the impressive indorsement given the management by the stockholders at the annual meeting April 1 in the defeat of the "stockholders' protective committee." Concerning the bonuses paid the five principal executive officers in 1918 Mr. Borie says that these covered services rendered by these officers through the years 1916, 1917 and 1918. The total additional compensation paid to over 700 salaried employees in the three years amounted to \$440,745, "which is a most moderate sum when the earnings of the company during

that period are taken into consideration and compares most favorably with similar payments made by concerns engaged in our line of business." The president says that the plants of the company are in exceptional condition and that their value has been written down to a conservative figure, based on peace conditions. As to the outlook, the report has the following:

Grave problems confront at this juncture every form of industry throughout the entire world; and while it is obviously impossible for anyone to forecast what the future will bring, it seems to me that the common sense and good judgment of the American people, so strikingly shown in other crises of our history, will reject the Utopian, impractical and impossible (at this period of human evolution) suggestions of men of good intentions and phrasemaking ability of a high order, but lacking in practical experience. No sane man will deny that the laboring man is entitled to his just and fair share of the prosperity of the country and to a voice as to what that share shall be, but labor must refrain from attempting to dominate its employer and must not interfere with the right of every man to earn an honest living in such manner as he may elect. Further, a certain amount of government supervision and control over our industries is conceded, but to enable the country to successfully carry on its business the paralyzing hand of too much paternalism and governmental control must be thrown off. Granted such improvement in the general situation, I feel that your company will be continuously successful.

Government Work of American Brake Shoe & Foundry

The American Brake Shoe & Foundry Co. earned a net income less in the 15 months ending Dec. 31, 1918, than the one for the 12 months ending Sept. 30, 1917, the comparison of a different month period being due to a change in the fiscal year. The figures are \$2,294,544 and \$3,232,242, respectively. The total production was: howitzers, 1800; howitzer battery spares, sets, 375; shell, 155 mm, 294,318; shell, 9.2-inch, 247,125. The outlay on these operations, not counting the cost of shops used for British shell, was about \$18,000,000. Inventories of pig iron, scrap iron, steel plate, coke, and other large items are entered at cost or market price Dec. 31, whichever is lower. The shops at Erie were used for machining shells for the British Government, while a new shop, adjoining the ones for shells, was built for howitzer machining. At the close of the year all plants were in practically normal condition and the quantity of melting stock and other supplies on hand, purchased when prices were high, was not unusually large.

Financial Notes

The Bonnot Co., Canton, Ohio, manufacturer of the Holbeck pulverized coal system and other machinery, announces the increase in its capitalization from \$500,000 to \$1,000,000. The company was incorporated in 1891 for \$100,000, which was increased in 1916 to \$500,000. The increase is in the form of 7 per cent preferred stock, the proceeds of which will be used as working capital. The officers of the company are: L. C. Bonnot, president; Henry W. Harter, vice-president; A. A. Oldham, secretary and treasurer. A. A. Holbeck is associated as manager of the pulverized coal department.

All of the new \$500,000 preferred stock issued by the Liberty Steel Co. has been placed, it is announced. The surplus, after stockholders had exhausted their rights, was marketed among local investors. Liberty preferred is to be exchanged, share for share, for Trumbull Steel Co. preferred when Trumbull Steel absorbs the Liberty Steel Co., July 1, 1919.

The Walworth Mfg. Co., maker of brass and iron goods and tools, suffered a decrease of \$218,120 in net earnings in 1918 from the year before, the amount being \$835,867. Common stock earned \$3.39 per share, compared with \$4.69 in 1917. The directors announce a plan of shop representation for the employees.

The Haskell & Barker Car Co. has unfilled orders of \$30,000,000 to tide it over the period of reconstruction. It furnished cars for the United States military rail-

ways and is now prepared to handle foreign orders. The business is affected by the uncertainty that surrounds the railroad situation. Net profits for the year ended Jan. 31, 1919, were \$3,586,917, compared with \$2,040,859 of the year before, and with \$694,618 of the 12 months previous to that. Common stock earned \$6.21, compared with \$9.27 and \$3.15 of the two years before.

The Pierce-Arrow Motor Car Co. turned out 8635 vehicles in 1918, of which 1168 were passenger cars and 7467 trucks. A contract was made with the Government for the making of Hispano-Suiza airplane engines. Net profits were \$2,765,741, compared with \$3,598,748 of the previous year.

Directors of the Truscon Steel Co., Youngstown, Ohio, have declared the regular dividend on common stock of 4 per cent, payable April 15 to holders of record April 5. President Julius Kahn states the company is well supplied with orders, insuring steady operations for some time to come. The directors authorized a small addition to the plant to cost \$50,000.

All former officers and directors of the Sharon Steel Hoop Co. were re-elected at the annual meeting held at Sharon, Pa., recently. No figures were given out as to the financial earnings of the company in 1918, but it is said they were very satisfactory. Officials re-elected were: Severn P. Ker, president; George Short, vice-president, and J. R. Evans, secretary and treasurer.

Net profits, less taxes, for the Westinghouse Air Brake Co. for 17 months, and the recently-acquired Union Switch & Signal Co. for 12 months aggregated \$7,461,900. The 17-month period results as the change in the fiscal year. There is a balance to surplus account of \$2,384,923.

The York Heating & Ventilating Corporation announces the opening of a Philadelphia office at 250 South Broad Street, with O. N. Walther as manager. This corporation is an expansion of the York Heating & Ventilating Co., of York, Pa. Howard J. Longenecker, of York, president of the new corporation, has been manager of the old company since it started, over 10 years ago. Mr. Walther, treasurer of the new corporation, and manager of the Philadelphia office, is a mechanical engineering graduate from Louisiana, and for over two years was an assistant to the chief engineer of the Buffalo Forge Co. at Buffalo. He enlisted in the Army, and was commissioned as lieutenant in the Chemical Warfare Section, Mechanical Research and Development Division, where he remained until recently, when he was released from active service.

Four additional publications in the industrial standards series of the Bureau of Foreign and Domestic Commerce are ready for distribution. These pamphlets contain standard specifications of the American Society for Testing Materials, in English and Spanish, and are designed primarily for distribution in Latin American countries to assist in introducing American construction and engineering materials. The serial numbers of the specifications and the products to which they relate are: No. 15, wrought solid carbon-steel wheels for steam railway service; No. 17, steel castings; No. 22, boiler rivet steel; No. 25, engine-bolt iron.

Judge Reed, United States Superior Court, New London, Conn., has appointed E. O. Cutler vice-president and manager of the Groton Iron Works of that city, and P. L. Harwood, treasurer of the Mariners' Savings Bank, New London, temporary co-receivers for the Groton company. The application was made by the United States Steamship Co., of which the iron works is a subsidiary, alleging that it had advanced the company \$800,000. Charles W. Morse is president of the Groton Iron Works.

The Abrams Iron & Steel Co., dealer in iron and steel scrap and metals, 4401-4499 Trumbull Avenue, Cleveland, has increased its capital stock from \$75,000 to \$150,000.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh on finished iron and steel products, including wrought iron and steel pipe, with revisions effective Nov. 1, 1918, in carloads, to points named, per 100 lb., are as follows: New York, 27c.; Philadelphia, 24.5c.; Boston, 30c.; Buffalo, 17c.; Cleveland, 17c.; Cincinnati, 23c.; Indianapolis, 25c.; Chicago, 27c.; St. Louis, 34c.; Kansas City, 59c.; St. Paul, 49½c.; Denver, 99c.; Omaha, 59c.; minimum carload, 36,000 lb. To the Pacific Coast the rate on steel bars and structural steel is \$1.315, minimum carload 40,000 lb.; and \$1.25, minimum carload 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 50c. per 100 lb., minimum carload 46,000 lb.; to Omaha, 50c., minimum carload 46,000 lb.; to St. Paul and Minneapolis, 49.5c., minimum carload 46,000 lb.; Denver, 99c., minimum carload 46,000 lb. A 3 per cent transportation tax applies. On iron and steel items not noted above, rates vary somewhat and are given in detail in the regular railroad tariffs.

Structural Material

1-beams, 3 to 15 in.; channels, 3 to 15 in. angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees, structural sizes, 2.45c.

Wire Products

Wire nails, \$3.25 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails taking an advance over this price of \$1.50, and shorter than 1 in., \$2.00. Bright basic wire, \$3.15 per 100 lb.; annealed fence wire, Nos. 6 to 9, \$3.00; galvanized wire, \$3.70; galvanized barbed wire and fence staples, \$4.10; painted barbed wire, \$3.40; polished fence staples, \$3.40; cement-coated nails, \$2.85 base; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 60½ per cent off list for carload lots, 59½ per cent for 1000-rod lots, and 58½ per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets.....\$3.70 base
Large boiler rivets.....\$3.80
¾ in., 5/16 in. and 7/16 in. diam. .65-10 and 5 per cent off list
Machine bolts h.p. nuts, ¾ in. x 4 in.:
Smaller and shorter, rolled threads.....60-10-5 per cent off list
Cut threads.....60-5 per cent off list
Larger and longer sizes.....50-10-5 per cent off list
Machine bolts, c.p.c. and t. nuts, ¾ in. x 4 in.:
Smaller and shorter.....45-10-10 per cent off list
Larger and longer.....40-10-5 per cent off list
Carriage bolts, ¾ x 6 in.:
Smaller and shorter, rolled threads.....60-5 per cent off list
Cut threads.....50-10-5 per cent off list
Larger and longer sizes.....45-10 per cent off list
Lag bolts.....65-5 per cent off list
Plow bolts, Nos. 1, 2, 3.....60 per cent off list
Hot pressed nuts, sq. blank.....3.25c. per lb. off list
Hot pressed nuts, hex., blank.....3.25c. per lb. off list
Hot pressed nuts, sq., tapped.....3c. per lb. off list
Hot pressed nuts, hex., tapped.....3c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank.....3.25c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped.....3c. per lb. off list
Semi-finished hex. nuts:
¾ in. and larger.....70-10-5 per cent off list
9/16 in. and smaller.....80 per cent off list
Stove bolts, in packages.....70-10-10-5 per cent off list
Stove bolts.....2½ per cent extra for bulk
Tire bolts.....60-10-10-5 per cent off list
The above discounts are from March 28, 1919.
All prices carry standard extras. Pittsburgh basis.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, \$52; chain rods, \$60; screw, rivet and bolt rods and other rods of that character, \$60. Prices on high carbon rods are irregular. They range from \$65 to \$75, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. x 4½ in. and heavier, and small spikes, per 100 lb., \$3.35 in lots of 200 kegs of 200 lb. each or more; track bolts, \$4.35 per 100 lb. in car load lots of 200 kegs, or more, and \$4.90 in small lots. Boat and barge spikes, \$3.85 per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh.

Terne Plate

Prices of terne plate are as follows: 8-lb. coating, 200 lb., \$13.80 per package; 8-lb. coating, I. C., \$14.10; 12-lb. coating, I. C., \$15.80; 15-lb. coating, I. C., \$16.80; 20-lb. coating, I. C., \$18.05; 25-lb. coating, I. C., \$19.30; 30-lb. coating, I. C., \$20.30; 35-lb. coating, I. C., \$21.30; 40-lb. coating, I. C., \$22.30 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.35 from mill. Prices on bar iron are 2.35c. for Eastern shipment and 2.55c. for Western shipment.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card.

Steel				Iron			
Inches	Black	Galv.		Inches	Black	Galv.	
1½, 1¼ and ¾	50½	24		1½ and 1¼	29½	24	
¾	54½	40		¾	30½	24	
¾ to 3	57½	44		¾ to 1½	29	23½	
Butt Weld				Lap Weld			
2	50½	38		1½	24½	19½	
2½ to 6	53½	41		1½	31½	17½	
7 to 12	50½	37		2	32½	19½	
13 and 14	41	..		2½ to 6	34½	21½	
15	38½	..		7 to 12	31½	19½	
Butt Weld, extra strong, plain ends				Lap Weld, extra strong, plain ends			
1½, 1¼ and ¾	46½	29		1½, 1¼ and ¾	28½	11½	
¾	51½	39		¾	33½	26½	
¾ to 1½	55½	43		¾ to 1½	39½	24½	
2 to 3	56½	44		2 to 3	36½	24½	
Butt Weld, extra strong, plain ends				Lap Weld, extra strong, plain ends			
2	48½	37		1½	25½	16½	
2½ to 4	51½	40		1½	31½	17½	
4½ to 6	50½	39		2	33½	19½	
7 to 8	46½	33		2½ to 4	32½	21½	
9 to 12	41½	28		4½ to 6	34½	21½	
				7 to 8	26½	19½	
				9 to 12	21½	9½	

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe have been nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots, f.o.b. Pittsburgh:

Lap Welded Steel	Charcoal Iron
3½ to 4½ in.....40½	3½ to 4½ in.....—16
2½ to 3½ in.....30½	3 to 3½ in.....—14
2½ in.....24	2½ to 2¾ in.....+1
1¾ to 2 in.....19½	2 to 2½ in.....—10
	1¾ to 1½ in.....—20

Standard Commercial Seamless—Cold Drawn or Hot Rolled

Per Net Ton	Per Net Ton
1 in.....\$327	1¾ in.....\$427
1¼ in.....267	2 to 2½ in.....171
1¾ in.....257	2¾ to 3¾ in.....187
1½ in.....207	4 in.....187
	4½ to 5 in.....207

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiation.

Sheets

Makers' price for mill shipments on sheets of United States standard gage in carload and larger lots are as follows:

Blue Annealed—Bessemer		Cents per lb.
No. 8 and heavier.....		3.50
Nos. 9 and 10 (base).....		3.55
Nos. 11 and 12.....		3.60
Nos. 13 and 14.....		3.65
Nos. 15 and 16.....		3.75
Box Annealed, One Pass Cold Rolled—Bessemer		
Nos. 17 to 21.....		4.15
Nos. 22 to 24.....		4.20
Nos. 25 and 26.....		4.25
No. 27.....		4.30
No. 28 (base).....		4.35
No. 29.....		4.40
No. 30.....		4.45
Galvanized Black Sheet Gage—Bessemer		
Nos. 10 and 11.....		4.70
Nos. 12 and 14.....		4.80
Nos. 15 and 16.....		4.95
Nos. 17 to 21.....		5.10
Nos. 22 to 24.....		5.25
Nos. 25 and 26.....		5.40
No. 27.....		5.55
No. 28 (base).....		5.70
No. 29.....		5.85
No. 30.....		6.20
Tin-Mill Black Plate—Bessemer		
Nos. 15 and 16.....		4.15
Nos. 17 to 21.....		4.20
Nos. 22 to 24.....		4.25
Nos. 25 to 27.....		4.30
No. 28 (base).....		4.35
No. 29.....		4.40
No. 30.....		4.40
Nos. 30½ and 31.....		4.45

Metal Markets

The Week's Prices

Cents per Pound for Early Delivery

Cents per Pound for Early Delivery							
Apr	Copper, New York		Lead		Spelter		
	Electro-lytic	Tin, New York	New York	St. Louis	New York	St. Louis	
	Lake	15.37½	72.50	5.25	5.00	6.55	6.20
	15.62½	15.37½	72.50	5.25	5.00	6.62½	6.27½
	15.62½	15.37½	72.50	5.25	5.00	6.70	6.35
	15.62½	15.37½	72.50	5.25	5.00	6.70	6.35
	15.62½	15.37½	72.50	5.25	5.00	6.65	6.30
	15.62½	15.37½	72.50	5.25	5.00	6.65	6.30

NEW YORK, April 8.

All the markets are quiet and the tone is easier. Demand for copper has slackened but prices are unchanged. There continues to be no change in the tin market which continues restricted and lifeless. Lead is nominally unchanged with demand very light. Prices for spelter have advanced slightly with but very little selling recorded. Antimony is higher.

New York

Copper.—Buying of copper has decidedly dwindled in the past week as compared with the activity of the week before, although there is a fair amount of inquiry from domestic consumers. There has been very little change in the price situation. Electrolytic copper is quoted at 15.37½c., New York, for early delivery, with Lake copper about 15.62½c. to 15.87½c., New York. It is regarded as an interesting fact that a little business has been done in copper on the New York Metal Exchange each day in the past week, and it tends to show what dealers think of the future of the market. While buying on the exchange has been a disappointment to some, the enterprise is regarded by others as having had a fair start. To-day 600 tons of electrolytic copper was sold on the exchange for delivery at 100 tons per month for the next six months at the flat price of 15.75c. While export demand is still very small, it is a fact that there have been recently fair sales, principally to England, of copper at a price substantially above the ruling domestic levels. Most of this business has been, however, in copper wire bars.

Copper Averages.—Because of a typographical error in THE IRON AGE of April 3, the average price of Lake copper in March was given as 15.64½c. instead of 15.46½c. The average price for electrolytic was 14.97½c.

Tin.—The tin market continues to be merely a case of waiting, and there has been no change in fundamental conditions. Very little headway has apparently been made in the disposition of the allocated tin, and until this is absorbed there can be no free open market. Opinion in the trade continues to be that something will occur before June 1 to re-establish normal conditions. There has been a little buying of tin for future shipment which shall be stored in England against permission to import to the United States, but just how much it is difficult to gage. Future tin was offered last week for April-May shipment from the Straits at 47.50c. Whether any was sold or not, either for storage in England or Canadian ports, is not known. When Government restrictions are lifted an active market is looked for, even possibly a wild and erratic one for a time. No tin arrivals have been reported thus far in April. Spots Straits was quoted in London yesterday at £226 10s.

Spelter.—Quotations for prime Western for early delivery have stiffened somewhat in the past week, due largely to the prospects of a strike at the smelters in the West because of a reduction in wages of a dollar per day. Should this have developed there would have been a reduction in output. It is understood, however, that there have been very few strikes and as a result prices are again easing slightly after having reached as high as 6.35c., St. Louis, the latter part of last week. Prime Western for early delivery is quoted to-day at 6.30c., St. Louis, or 6.65c., New York, with

the demand light. The uncertainty in steel prices and hence in the galvanizing trade is one cause. It is understood that 300 tons for early delivery was sold yesterday at 6.30c., St. Louis. An arrangement has been made with the Government whereby Government stocks of spelter will be disposed of over the next 15 months in a manner similar to that arranged for copper a few weeks ago. The Government stocks of spelter are much smaller than supposed.

Lead.—The metal for early delivery is quoted nominally at 5.25c., New York, and 5c., St. Louis, which is the quotation of both the leading interest and the outside market. There has been very little demand, and the market is exceedingly dull but fairly firm. There has been a little underselling within the last week, with offers of the metal at 5.20c., New York, and it is probable that a little business resulted at this level.

Antimony.—The market is stronger, but not particularly active, with the metal obtainable at 6.62½c. to 6.75c., New York, duty paid, for Asiatic grades.

Aluminum.—The market is quiet with No. 1 virgin metal, 98 to 99 per cent pure, quoted at 29c. to 30c., New York, for early delivery.

Old Metals.—The market is firm. Dealers' selling prices are nominally as follows:

	Cents per lb
Copper, heavy and crucible.....	15.75
Copper, heavy and wire.....	14.50
Copper, light and bottoms.....	12.25
Brass, heavy.....	11.25
Brass, light.....	7.50
Heavy machine composition.....	15.00
No. 1 yellow rod brass turnings.....	8.25
No. 1 red brass or composition turnings.....	12.50
Lead, heavy.....	4.75
Lead, tea.....	4.00
Zinc.....	5.25

St. Louis, April 7.—There is an increasing disposition to buy. Quotations at the close to-day were: Lead, car lots, 5c.; spelter, car lots, 6.30c. In less than car lots the prices were: Lead, 5.25c.; spelter, 6.50c.; copper, 17c.; Asiatic antimony, 8c.; tin, out of the market, but nominally 72.50c. In the Joplin district the demand for ore was good at a top basis for zinc blende, basis 60 per cent, of \$37.50 per ton, while the sheet zinc makers paid as high as \$40 for choice ores. Calamine was steady at \$26 to \$27 per ton, basis 40 per cent. Lead was \$60 to \$61 per ton, basis 80 per cent. The averages for the week were: Zinc blende, \$41, calamine, \$27 and lead \$60 per ton. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 6c.; heavy yellow brass, 8.50c.; light copper, 10c.; heavy red brass and heavy copper and copper wire, 12c.; pewter, 35c.; tin foil, 40c.; lead, 4c.; tea lead, 3c.; zinc, 3c.

CHICAGO, April 7.—There has been increased activity in copper in the last few days. The trade is purchasing ahead evidently on the assumption that advances may develop at any time. There has been a small amount of business in tin. The lead situation is spotty with the price down a few points. Spelter is inactive, and there is the usual small day-to-day business in antimony. In connection with tin, it is pointed out that the official tin committee has stopped the sale of the output of American producers pending the disposal of the stock held by the United States Steel Products Co. Jobbers, however, are permitted to sell metal on hand. We quote copper at 16c. to 16.50c. for carloads; tin, 72.50c.; lead, 5.10c. to 5.25c.; spelter, 6.45c. to 6.50c.; antimony, 8c. to 8.50c. On old metals we quote copper wire, crucible shapes, 13c.; copper clips, 12.50c.; copper bottoms, 11c.; red brass, 13c.; yellow brass, 8c.; lead pipe, 3.50c.; zinc, 4c.; pewter, No. 1, 32c.; tin foil, 37c., and block tin, 50c., all these being buying prices for less than carload lots.

CINCINNATI, April 7.—Copper and brass scrap is very much firmer, and to-day's quotation on crucible copper scrap runs from 13c. to 13½c. Copper wire is also quoted around the same price. Lead is weak at 4c. Business in all kinds of non-ferrous metal scrap is very slow.

PERSONAL

Last week E. E. Slick, director and vice-president in charge of operations of the Cambria Steel Co., Johnstown, Pa., resigned both positions, and also resigned all positions he held as a director, and in any other capacity, in the Midvale Steel & Ordnance Co. and subsidiaries, completely severing his connection with that company. Mr. Slick became connected with the Cambria Steel Co. in 1912, as general manager, when W. H. Donner was president. For many years, he had been connected with Carnegie Steel Co., first as a draftsman, and finally rising to the important position of chief engineer of the company, which he held for some years. Mr. Slick is a designer and inventor of many processes used in the manufacture of steel in various forms, and was also the designer and inventor of the Slick process for making steel car wheels. He is recognized as one of the leading engineers of the world in the iron and steel industry. He has made no announcement as to his plans for the future.

Mr. Slick will be succeeded by Alfred A. Corey, brother of William A. Corey, chairman of the board. Mr. Corey has been general superintendent of the Homestead works of Carnegie Steel Co. He will make his headquarters at the general offices of the Midvale and Cambria companies, Widener Building, Philadelphia. Mr. Slick's future connection has not yet been announced.

John S. Oursler, superintendent, Ordnance Department, United States Steel Corporation, has been selected to succeed Alfred A. Corey, Jr., as general superintendent of the Homestead Steel Works of the Carnegie Steel Co., Homestead, Pa. When the ordnance plant, to be built by the United States Government at Neville Island, Pittsburgh, was projected, Mr. Oursler was made general superintendent, but with the abandonment of this project, he was relieved of active work. Mr. Oursler for some years was general superintendent of the Newcastle, Farrell and Sharon, Pa., works of the Carnegie Steel Co., leaving that position to take charge of the erection of the proposed ordnance plant at Neville Island.

Henry M. O'Brien, who has been assistant to L. H. Burnett, assistant to H. D. Williams, president of Carnegie Steel Co., Pittsburgh, has resigned to become assistant to A. C. Dinkey, president of the Midvale Steel & Ordnance Co., with headquarters in the Widener Building, Philadelphia. Mr. O'Brien became Mr. Burnett's assistant in November, 1912. He was then special agent in charge of the local office of the United States Department of Justice, where he had served seven years. He has been in charge of the Carnegie Steel Co.'s safety, welfare and industrial relations department, and under his direction that department has come to be regarded as one of the most efficient of its kind in the country. Mr. O'Brien will have charge of the same kind of work for the Midvale Steel & Ordnance Co. He went to Pittsburgh from Parkersburg, W. Va., where he was a newspaper man before being appointed a Government agent.

H. C. Kensing, recently general manager for Julius Blum & Co., New York, is now associated with the U. T. Hungerford Brass & Copper Co., Lafayette and Franklin streets, New York.

George Hills has resigned as manager of factory sales for the American Rolling Mill Co., Middletown, Ohio, to accept the general management of the Ohio General Tractor Co., Cleveland.

James Posey, 925 Fidelity Building, Baltimore, who has been engaged in work for the Government, has reopened his engineering office. While working for the Government he designed and superintended the installation of power plants, heating, etc. He also superintended the installation of the high-tension electrical distributions for the Bartlett-Hayward Co., Baltimore, and the Symington-Anderson Forge Co., Rochester. He has associated with him George W. Gail, Jr., who has

been connected with the Bethlehem Steel Co., Sparrows Point, Md., and the Curtiss Aeroplane Co., Buffalo. Mr. Posey also has opened branch offices in New York and Washington.

Howard E. Gallaher, superintendent of the employment department of the Steelton plant, Bethlehem Steel Co., leaves that position, April 10, to accept a similar position with John J. Roebling Sons Co., Trenton, N. J. H. W. Zook, in charge of the company's real estate department, will succeed him.

Duncan G. Sinclair, formerly chief assistant engineer of the Pittsburgh Railway Co. and the Duquesne Light Co., Pittsburgh, has been appointed New York manager for the Pitting Piping & Equipment Co., Pittsburgh, which has opened an office in the St. Paul Building, 220 Broadway, New York.

The Tacony Steel Co., Philadelphia, has opened a New York office at 2 Rector Street, its office having until recently been at 50 Church Street. Paul J. Driscoll, recently connected with the sales department of the Lackawanna Steel Co. in Philadelphia, is in charge of the office as New York district sales manager and has as his assistant W. W. Corkram, who was connected with the Midvale Steel & Ordnance Co., Philadelphia, for a number of years.

F. F. Fuessenich, after 40 years' connection with the Hendey Machine Co., Torrington, Conn., retired on April 1 as president and treasurer. The directors of the company at the quarterly meeting, March 29, elected Mr. Fuessenich chairman of the board for the ensuing year. Charles H. Alvord, who has been vice-president and general manager since the death of Mr. Hendey in 1906, was elected president and treasurer, and Robert C. Swayze was elected vice-president. The other officers are: F. N. McKenzie, secretary; F. W. Fuessenich, assistant treasurer, and John Jack, assistant secretary.

L. M. Bradley has resigned as manager of the Motor and Accessory Manufacturers' Association, New York. The directors have appointed as general manager M. L. Heminway.

J. P. Yoder, formerly special examiner of the Federal Trade Commission, Washington, was sworn in this month as secretary to the commission to succeed Leonidas L. Bracken, who resigned recently. Mr. Yoder left the commission in February, 1918, being commissioned a captain in the Army Sanitary Corps. He has but recently returned from service in France.

Harry J. Sproat has joined the "New Way" Motor Co., Lansing, Mich., as secretary and factory manager. Mr. Sproat has had many years' experience as a practical factory executive, having been works manager of one of the largest automobile factories in the country.

I. H. Cohn, formerly of the National Steel Rail Co., has become associated with the Standard Rail & Steel Co., St. Louis, and will be in complete charge of the rail department, handling all matters relative to laying rails and railroad equipment.

The Sullivan Machinery Co., Chicago, manufacturer of mining and quarrying machinery, has recently organized a foreign trade department, with F. W. Copeland, formerly attached to the St. Louis office, as manager, with headquarters at Chicago.

A. I. Humphrey, vice-president and general manager Westinghouse Air Brake Co. since 1909, was chosen president at the annual meeting of stockholders in the general offices at Wilmerding, Pa., last week. He will succeed John F. Miller, who, after 30 years of active service as the head of the Westinghouse Company, will retire from his duties, but will retain the position of vice-chairman of the board of directors. The new president has been a member of the company since 1903, when he was appointed western manager, with headquarters in Chicago. He went to Pittsburgh in 1905 as general manager, and in 1909 he was elected vice-president. Two new vice-presidents were also chosen by the stockholders, W. S. Bartholomew, who succeeded Mr. Humphrey as Western manager in 1909, and C. A. Rowan, who is now controller, having risen

through the ranks from the position of clerk. The following board of directors was also chosen at the meeting: Ben V. Becker, James D. Callery, E. M. Herr, A. L. Humphrey, John F. Miller, John F. McCune, John R. McGinley, Charles McKnight, M. S. Rosenwald, W. D. Uptegraff and H. H. Westinghouse.

Lieut.-Col. Merrill G. Baker has been appointed president of the American International Steel Corporation. He was formerly assistant general manager of sales for the Cambria Steel Co. He entered the Ordnance Department shortly after American entered the war. Colonel Baker succeeds the late Edward M. Hager, who died about a year ago. Meanwhile the business has been in charge of Morris Metcalf, vice-president, who remains with that title. The American International Steel Corporation is a subsidiary of the American International Corporation, and is engaged in the exporting of steel products and railway equipment.

Frank J. Coffey has been appointed sales representative for Indiana for the Morgan Spring Co., Worcester, Mass. Mr. Coffey has had wide experience in the plant at Worcester and has just returned from service in the United States Army. He will be located at 305 Merchants' Bank Building, Indianapolis.

J. C. Sellers, Jr., for the past three years assistant purchasing agent of the Penn Seaboard Steel Corporation, has left this company to become secretary of H. P. Pearl & Co., Inc., iron and steel scrap, Widener Building, Philadelphia.

George Endicott, who recently resigned as assistant sales manager of the Wickwire Steel Co., Buffalo, has been appointed sales manager of the Morgan Spring Co., with headquarters at Worcester, Mass.

W. F. McLaughlin has been appointed factory superintendent of the Hyatt bearings division, General Motors Corporation, at Harrison, N. J.

Frank B. Lounsbury, metallurgist Acme Crucible Steel Co., Dunkirk, N. Y., was the guest of honor and principal speaker at the first formal dinner and meeting of the new Milwaukee Chapter, American Steel Treasurers' Society, at the Hotel Wisconsin on Wednesday, April 2. Mr. Lounsbury delivered an illustrated talk on modern methods of tool steel production.

J. G. Lude, purchasing agent Falls Motors Corporation, Sheboygan Falls, Wis., for six years, resigned April 1 to become assistant general manager of the Lewis Steel Products Co., Toledo, Ohio. A. R. Clas, president and general manager of the Lewis Co., formerly was secretary and treasurer of the Falls Motors Company.

Alexander Luchars, publisher of *Machinery*, has been appointed by the Department of Commerce as United States trade commissioner to Great Britain and Continental Europe for the purpose of studying conditions affecting the sale and use of American machine tools and supplies there. He will sail April 26.

T. E. Doremus, Wilmington, Del., has been transferred to the E. I. du Pont de Nemours Export Co. as general Eastern manager with headquarters in Shanghai, China. E. R. Galvin, of the Du Pont Company, has been appointed manager of the sporting powder division to succeed Mr. Doremus.

W. A. Greenawalt, recently appointed open-hearth superintendent of the Cromwell Steel Co., Lorain, Ohio, has been made acting general superintendent of the Cromwell plant, and is now making some repairs on the plant which will be placed in operation about April 15.

Hamilton Stewart, vice-president, Harbison-Walker Refractories Co., Pittsburgh, has returned from a business trip to Cuba.

The Abell-Howe Co., of Chicago, distributor for the manufacturers of the products of the Howe Chain Co. and other companies, has established a branch in St. Louis, with offices in the Frisco Building, in the charge of L. H. Littlefield, who during the war was in the engineering and inspection departments of the Aircraft Bureau of the War Department.

W. H. Warren, general manager, Brier Hill Steel Co.; James H. Grose, district superintendent Carnegie Steel Co., and C. S. Robinson, vice-president and gen-

eral manager, Youngstown Sheet & Tube Co., were principal speakers at a meeting this week of the Engineers' Club of the Youngstown district.

Willis L. King, vice-president, Jones & Laughlin Steel Co., Pittsburgh, is convalescing from an operation at his home in the East End, Pittsburgh, but expects to leave for Atlantic City about April 15 for an extended visit.

J. Rowland Brown, who has been manager of the electrical and valve departments of the Ohio Brass Co., Mansfield, Ohio, has become general manager of the Reliance Gauge & Column Co., Cleveland.

F. V. Sargent has been appointed by the Chicago Pneumatic Tool Co. district manager of sales in the Boston territory, succeeding F. S. Eggleston, with headquarters at 182 High Street, Boston.

Gen. George W. Goethals announces the association of A. E. Borie, president Savage Arms Corporation, with George W. Goethals & Co., Inc., consulting engineers, 40 Wall Street, New York. Mr. Borie in a letter to the stockholders of the Savage Arms Corporation says that he has laid his resignation as president before the board of directors but that he is arranging to comply with the request that he continue in the capacity of chairman of the board.

E. C. Cherrington and T. R. Cooley, who for the past few years have been in the sales service department of The Cutler-Hammer Mfg. Co. at Milwaukee, have been transferred to the Pittsburgh office of the central district, Mr. Cherrington becoming office manager and Mr. Cooley engineering correspondent. Many Cutler-Hammer employees who were in the service have returned either to the works and general office at Milwaukee, or to the various district offices. Most of them have taken up their former positions. Those returning to the company's district offices are: New York—E. P. Doherty, A. F. Ericsson, Mr. Hoppin, Ogden MacGillivray, Herbert Reusch, G. W. Strong, T. L. Merrit; Boston—Robert A. Tibbetts, Walter J. Murphy, Carlisle Gordon; Cleveland—G. W. Thompson, A. R. Raatz; Philadelphia—George Mallon, Bayard M. Horter; Chicago—C. W. Greenman, Malcolm Dugliss, C. Condon.

Major Winthrop Withington, division ordnance officer of the Seventh Division, A. E. F., has been made a lieutenant-colonel. Mr. Withington is first vice-president of the Reynolds-Chrysler Co., vice-president of the Sparks-Withington Co., and general manager of the American Fork & Hoe Co., all of Jackson, Mich.

L. E. Strothman, manager pumping engine and steam turbine departments, Allis-Chalmers Mfg. Co., Milwaukee, has been appointed to represent the American Society of Mechanical Engineers on the National Industrial Conference Board. The president of the society, Prof. M. E. Cooley, dean of the mechanical engineering school, University of Michigan, Ann Arbor, Mich., has also been appointed a member of the board.

The Hendey Machine Co., Torrington, Conn., manufacturer of lathes, milling machines and shapers, has appointed Ateliers Demoor of Brussels, Belgium, as its Belgian representative. Honore Demoor of that firm is at present in this country.

A. H. Noyes, formerly treasurer Ayer & Lord Tie Co., Chicago, who resigned to enter the sanitary train, First Division, American Expeditionary Force, has returned from France and has been elected president of the Hills-McCanna Co., Chicago, manufacturers of patented steam specialties, succeeding Robert E. Hills, retired.

G. M. P. Murphy has been elected director of the Bethlehem Steel Co. in the place of Nelson D. Jay, the other directors having been re-elected.

Major Brinton Buckwalter, late of the ordnance department, U. S. A., and formerly of Breitung & Co., New York, has been made manager of an office which the Thompson & Lichtner Co., consulting engineers of Boston, has established at 25 Pine Street, New York. Col. Sanford E. Thompson, who has been with the War Department in Washington, has returned to active

service with the firm and M. S. Dowd, formerly of the United States Shipping Board, specializing in scientific management, is one of the recent additions to the staff of the company.

Hilem F. Paddock, mayor of Saginaw, Mich., has resigned to accept a position with the Saginaw Malleable Iron Co. as assistant to the president.

David Tod, director and member of the executive committee of the Brier Hill Steel Co., has returned from Camden, S. C., where he spent the past two months.

K. E. Humbert, Perin & Marshall, consulting engineers, New York, left New York April 5 for a trip to China and India by way of England.

Lieut.-Commander H. J. Elson, U. S. Naval Reserve Force, has been released to inactive status and has resumed his civilian work as secretary and treasurer, Walter A. Zelnicker Supply Co., St. Louis, in charge of internal management and manufacturing operations.

Hiram P. Maxim, Maxim Silencer Co., Hartford, Conn., spoke on "The Mechanics of the War," and Frederick T. B. Moore, Colt's Patent Firearms Mfg. Co., of the same city, discussed "The Development of the Machine Gun," at a meeting of the East Hartford Chamber of Commerce, April 8.

Charles H. Alvord succeeds Frederick F. Fuessenich as president and treasurer of the Hendey Machine Co., Torrington, Conn. Robert C. Swayze is elected vice-president; F. N. McKenzie, secretary; Frederick W. Fuessenich, assistant treasurer, and John Jack, assistant secretary. Mr. Alvord has been vice-president and general manager since the death of Henry J. Hendey in 1906. Mr. Fuessenich joined the company in 1870, was elected secretary in 1883, and became president and treasurer in 1906. He will remain as chairman of the board of directors.

Dudley H. Cohen, formerly vice-president William Brewster Co. and assistant treasurer Trojan Tool Corporation, has sold his interest in the Brewster company in order to devote all his time to the Trojan Tool Corporation, in which company he has been elected treasurer and general manager in charge of production and sales.

Thomas H. Spragle, who recently returned from overseas where he served with the Rainbow Division, has taken up his duties as purchasing agent and chief of traffic department of the Standard Process Steel Corporation, maker of gears and steel and iron castings, Phillipsburg, N. J.

F. M. Fay, for several years with the Boston office of the Westinghouse Electric & Mfg. Co., has resigned, to become sales manager for the E. W. Ham Electric Co., Worcester, Mass. He was given a farewell dinner by the office force at the Boston City Club, and presented a mahogany desk clock.

Prof. John R. Allen, dean of the school of mechanical engineering, University of Minnesota, has been appointed director of the research bureau established at Pittsburgh by the Society of American Heating and Ventilating Engineers with the co-operation of the Bureau of Mines.

The Underwriters' Laboratories have approved the 2½-gal. Foamite Firefoam hand extinguisher, manufactured by the Foamite Firefoam Co., 200 Fifth Avenue, New York. The extinguishing solutions, when discharged on a fire, form a tough, durable blanket of carbonic-acid gas bubbles, which, it is explained, float on burning liquids, or coat blazing surfaces. The solutions expand to eight times their original volume.

The Heinle Co., metal-rolling engineer, Crafton, Pittsburgh, adds a self-explanatory chart on rolled hexagon to the number of other charts already issued. This chart sets forth a positive three-pass method for rolling hexagon either by guide or by hand. Dimensions of the bar anywhere in the progressive conformation can be secured, so that positive control over the mechanical conditions during rolling is had.

The Tennessee Manganese Co., Cleveland, Tenn., is planning the erection of a new furnace for making ferromanganese, initial capacity about 10 tons.

OBITUARY

OWEN BRAINARD, architectural and consulting engineer, died of heart disease April 2, while visiting friends in the city of his residence, New York. He was best known because of his work in designing and supervising the structure of the New York Public Library, the extension of the Capitol at Washington, and the New Theatre, now called the Century, in New York. He also was author of the design of the Yale Memorial Building, the massive Lincoln Memorial and Congressional buildings at Washington, the Cornell University Building, and industrial villages for the employees of the United States Steel Corporation in Pennsylvania. He was born in Haddam, Conn., in 1865, moved to New York when a boy, and studied architecture and structural engineering. From 1901 to 1907 he was a member of Carrere & Hastings, architects. Then he established an office at 52 Vanderbilt Avenue as a consulting engineer. Mr. Brainard was a member of the American Society of Civil Engineers, the American Institute of Architects, the Architectural League of New York, the Engineers' Club and the Apawamis Club. He is survived by his wife.

STANLEY FLAGG, SR., long prominent in the malleable castings industry as founder of Stanley G. Flagg & Co., Philadelphia, died at his home in that city last week at the age of 89. Mr. Flagg founded the business in 1856 and was closely identified with its development until his retirement on Jan. 1, 1909. He was born at Whitesboro, N. Y., March 13, 1830, and spent the early years of his life in Boston. In his early manhood, after some experience in the dry goods business, which he found uncongenial, he investigated the business of making malleable iron pipe fittings and castings, and soon established a plant at Frankford, a suburb of Philadelphia. He was probably one of the first to make malleable pipe fittings entirely in one plant, the machine shop and foundry engaged on this work having been separated previously. In 1860 Mr. Flagg built shops at Front Street and Girard Avenue, Philadelphia, and in 1865 bought property at Nineteenth Street and Pennsylvania Avenue, where a second plant was built. The Pottstown, Pa., works was started in 1896. The manufacture of small steel castings was begun in 1873.

ERNEST LAW, for many years a pig iron merchant in Philadelphia as a member of the firm of Ernest Law & Co., Harrison Building, died on April 4 of pneumonia. He was 61 years old. Mr. Law was a graduate of the University of Pennsylvania, class of 1877. He was a member of the Pennsylvania Society of Colonial Governors, the Philadelphia, Union League and University Barge clubs. In business Mr. Law was associated with J. MacIntyre Jaycox. The funeral was held on Monday afternoon from St. Mary's Church, Wayne, Pa.

FRANK W. HASKELL, president Carborundum Co., Niagara Falls, N. Y., died suddenly of heart trouble, April 2, at his winter home in Daytona, Fla., aged 57. Mr. Haskell was born in Brooklyn, Dec. 17, 1861. In 1887 he became associated with H. C. Frick and was connected with the H. C. Frick Coke Co. until 1898, when he was made vice-president of the Carborundum Co., being made president a year later.

JOHN F. SHANLEY, member of David S. Foster Sons & Co., Utica, N. Y., contractors' tools, died suddenly at his home in that city, March 31, of blood clot on the brain, at the age of 46. He entered the employ of David S. Foster in 1893, and in 1902 became a member of the present partnership and was put in charge of finances. He had formerly been employed by Roberts, Parry & Co., of the same city.

BARRY HOLME JONES, secretary and director Bethlehem Steel Corporation and subsidiary companies, died April 3 at his home in Bethlehem, Pa., of heart disease. He was 45 years old, and before joining the Bethlehem forces was manager of the Bloomsburg Elevator Works.

EDWIN H. WARREN, member of the Woburn Gear Works, Woburn, Mass., died of pneumonia, April 2, at his home in Woburn, aged 39 years.

Chain Prices Reduced

At a general meeting of chain manufacturers held at the Waldorf-Astoria Hotel in New York on Tuesday, March 25, prices on all grades of chain were greatly reduced. The new prices were submitted to the American Iron and Steel Institute for approval of the Industrial Board of the Department of Commerce at Washington. Prices on proof coil chain, 3/16 in. in size were reduced \$60 per ton, 1/4 in. \$30 per ton and all other sizes from 5/16 and larger were reduced \$20 per ton. The base price in effect from April 1 is \$6.50 per 100 lb. and extras are as follows:

CLASSIFIED LIST OF EXTRAS ON POUND CHAIN TO BE ADDED TO PROOF COIL PRICES. BASE SIZE 1 in.

For prices on other sizes add to base size as follows:

3/16 in.	1/4 in.	5/16 in.	3/8 in.	7/16 in.	1/2 in.	5/8 in.	3/4 in.	7/8 in.	1 in.	1 1/8 in.	1 1/4 in.	Base	Base
\$4.20	\$4.50	\$2.00	\$1.00	\$.80	\$.65	\$.45	\$.20	\$.10					

This will make the price for proof coil chain using 1 in. size for base at \$6.50 per 100 lb., f.o.b. Pittsburgh, as follows:

3/16 in.	1/4 in.	5/16 in.	3/8 in.	7/16 in.	1/2 in.	5/8 in.	3/4 in.	7/8 in.	1 in.	1 1/8 in.	1 1/4 in.	Base
\$11	\$10	\$8.50	\$7.50	\$7.30	\$7.15	\$6.95	\$6.70	\$6.60	\$6.50			\$6.50

Twist Link, 3/16 in. to 7/16 in. inclusive—\$1.00 per 100 lb. advance.

Bright Coil Chain, 50c. per 100 lb. advance.

Coil Chain in Exact Sizes:

3/16 in.	\$2.00 per 100 lb. advance.
1/4 in.	1.50 per 100 lb. advance.
5/16 in. and larger in exact sizes take special price.	
BB and BBB per 100 lb. advance over proof quality:	
BB quality 3/16 in. and 1/4 in.	\$2.00
BB quality 5/16 in. and 3/8 in.	1.50
BB quality 7/16 in. and larger.	1.25
BBB quality 3/16 in. and 1/4 in.	4.00
BBB quality 5/16 in. and 3/8 in.	2.50
BBB quality 7/16 in. and larger.	2.25

Iron Chain: For iron chain, add as follows to price of proof, BB and BBB coil:

3/16 in.	1/4 in.	5/16 in.	3/8 in.	7/16 in.	1/2 in.	5/8 in.	3/4 in.	7/8 in.	1 in.	1 1/8 in.	1 1/4 in.	per 100 lb.
\$1.50	\$1.80	\$1.75	\$1.70	\$1.65	\$1.65	\$1.60			\$1.60			

Galvanizing: Add to price of self-colored chain:

3/16 in.	1/4 in.	5/16 in.	3/8 in.	7/16 in.	1/2 in.	5/8 in.	3/4 in.	7/8 in.	1 in.	1 1/8 in.	1 1/4 in.	per 100 lb.
\$2.50	\$2.40	\$2.30	\$2.20	\$2.10	\$2.00	\$1.90	\$1.80					

Corrugator Chain:

Proof quality	\$1.00 per 100 lb. advance over proof coil.
BB quality	1.50 per 100 lb. advance over proof coil.
BBB quality	2.00 per 100 lb. advance over proof coil.

Log Chain:

Self-colored,	\$1.25 per 100 lb. advance over proof coil.
Bright,	\$1.75 per 100 lb. advance over self-colored proof coil.

A Co-Industrial College of Technology

A co-industrial or co-operative system of education has been developed in the College of Technology, Newark, N. J. This system provides for alternating two weeks' periods of industrial activity and college work throughout the course. Only one or two men are placed in any department or industry, in order to avoid any conditions which might arise to do the industry an injustice. The student will perform such duties as will not only aid the industry, but provide him with knowledge necessary to make him a working engineer. The plan works no hardships on the industry, but, on the contrary, renders vital assistance now and in the future.

The student spends 22 weeks of each year in the industry and the rest in the college. His work is so closely correlated with industrial activity that upon his return to the institution special lectures and laboratory work are provided to prepare him for the next two weeks in the industry. In other words the electrical, chemical and sanitary laboratories and other fields of activity are the laboratories of the college. At the end of four years the student receives a degree of B. S. After spending two years in an industry having the special activity for which he fitted himself as a working engineer, the college will grant him an engineering degree.

The college term opens Sept. 22, 1919. Dr. D. R. Hodgdon, 367 High Street, Newark, is director.

Steel from Iron Ore Using Two Electric Furnaces

TORONTO, ONT., April 5.—A new method for the smelting of iron ores has just been patented in the United States and Canada by James W. Moffat, 366 Sackville Street, Toronto, Ont. The novelty lies in duplexing with two electric furnaces, and the process, which is called "discontinuous," is said to be convenient in operation and suitable for meeting trade demands. The ore is first treated in a reducing furnace of comparatively low temperature in which it is deprived of its oxygen as completely as possible. The product, which is known as sponge, is transferred either hot or cold into an electric furnace to be melted down and finished.

Canadian iron ores in many cases do not admit of economical reduction in the blast furnace. Under the new process the first step is the reducing of the ore and its conversion into the metallic state but in the form of sponge. The next step is the transference of this sponge into the electric furnace where it is completed. This process is claimed to be particularly adapted to the manufacture of iron and steel and ferroalloys. The iron sponge is iron in a porous form obtained by reduction without fusion. The reduction of iron ores into this form has been attempted by the use of gas, but the sponge was liable to re-oxidize when cooled or remelted in an oxidizing atmosphere.

The ore bodies in the older and more populous parts of Canada are low grade, and Mr. Moffat states that, as there are many large water powers available for the generation of electricity at many points sufficiently convenient for the transmission of this power to suitable smelting locations, the difficulties experienced in the past can be largely overcome by a reversion to the iron sponge of the ancients and, without removal, finishing the metal into any desired iron or steel. In Mr. Moffat's process, for which patents have been granted (Canadian patent No. 186,994, Oct. 15, 1918, and U. S. patent issued Feb. 18, 1919) for the duplexing of a reduction furnace with an electric melting furnace, it is immaterial how the sponge is made.

The Wharton Steel Co., Wharton, near Dover, N. J., has acquired the property and rights of the Black Rock Mining Co., in the vicinity of Dover and Morristown, and will use the lands in connection with its other iron ore properties in that section. Effective April 2, employees at the works went out on strike, with demands for 50c. per hr. and an 8-hr. working day. The company, it is understood, has offered 40c. per hr. About 600 men are employed at the plants and one-third of this number, approximately, remained at work.

The Cass County Iron Co. has been incorporated at Dallas, Texas, with a capital stock of \$10,000, for the purpose of developing beds of iron ore in Cass County which it owns. The incorporators are Talman Bigelow of Oyster Bay, N. Y., T. G. Murnane and D. A. Eldraidge of Dallas. Charles A. Martin and Byrd D. Wise of New York are members of the board of directors.

An industrial exhibition will be held in Brooklyn in the week of April 28 at the Twenty-third Regiment Armory, Bedford Avenue, under the auspices of the Brooklyn Engineers' Club. It is stated that there will be 135 exhibitors and that the firms represent a total of \$700,000,000 in annual sales.

The Warren Steel Casting Co., St. Louis, has opened general sales offices in charge of J. P. Pero, Jr., who is vice-president and sales manager of this company, in the Boatmen's Bank Building, St. Louis; Railway Exchange Building, Chicago, and Book Building, Detroit.

Standard Rail & Steel Co., St. Louis, recently moved into new quarters for its office, located in Suite 1108-1115 Boatmen's Bank Building. The fully equipped and modern plant covering 15 acres in Madison, Ill., is nearing completion.

Machinery Markets and News of the Works

BELGIAN INQUIRIES

Two Fairly Large Lists in the Market

S. K. F. Ball Bearing Co. Inquiring for Tools for New Plant—New Business Moderate

There are several fairly large inquiries for machine tools in the New York market, two of them for shipment to Belgium. The representative of a plant at Liege, which was completely destroyed in the war, is in this country seeking a complete new equipment for the manufacture of automobiles, motorcycles and bicycles. The Belgo-American Corporation, which is affiliated with Alcorn, Blockhouse & Co., engineers, Philadelphia, is getting quotations on a large list for Belgium, about 100 drilling machines being included.

One of the most important domestic inquiries comes from the S. K. F. Ball Bearing Co., New York, which may build a new plant in Philadelphia for the manufacture of hangers for shafting. Quotations are being gotten on complete machine shop and foundry equipment. The Standard Oil Co. of New Jersey will probably buy considerable equipment during the next few months. Its most active list is for a ship repair plant at Bayway, N. J., but other inquiries cover tools for

new oil refineries, and it is reported that the company may build a shipyard in North Europe, probably in Norway. A large list of tools for shipment to Rumania, issued several weeks ago, is still pending.

The machine-tool trade is disappointed because of the action taken by the French High Commission in suspending all purchasing of tools. Its list called for close to \$1,000,000 worth of equipment for shipment to France. Formal orders in most instances had not been placed, hence nearly all of this business is held up, probably until after the peace treaty is signed.

An announcement of interest to the trade has been issued by the president of the General Motors Corporation, who states that appropriations totalling \$37,398,000 have been made for extensions to plants in various cities. A considerable portion of this will doubtless be expended for machine tools.

The War Department has decided to ship some machines used on war contracts in private plants to Government arsenals.

Inquiries are numerous in the Chicago market, the tractor and gas engine industries continuing prominently as factors in the demand. There has also been some buying by washing machine manufacturers.

A moderate volume of small orders is reported from Cleveland, while the Cincinnati trade finds business slowing down somewhat.

New York

New York, April 8.

Despite the many circumstances which are holding back the placing of business, the machine-tool trade maintains a certain degree of optimism because of a belief that the great volume of inquiries now being received is an indication that eventually substantial machine-tool orders will come. The number of inquiries is ahead of anything known in pre-war times, but machine-tool men agree that they have never seen a time when it was so difficult to close business as now. While general business is hesitant because of such factors as the uncertainty as to the terms of peace, the controversy at Washington over steel prices, rates of foreign exchange and other discouraging conditions, the one outstanding reason given by nearly all prospective buyers of machine tools for not making purchases after they have inquired is that they believe prices should be or will be lowered.

Manufacturers of machine tools declare that buyers in their expectation of lower prices are putting all machine tools in one class. The fact is, they say, that some tools were unduly raised in price during the war, but that these are in the minority and that the majority of makers of standard tools raised their prices only enough to cover increased costs of labor and material, and that as yet there has not been a sufficient change in these costs to justify reductions. Some go so far as to say that general reductions cannot come before July 1, or later.

Among the inquiries in the market two of the largest are for Belgium. The representative of a plant at Liege, which was completely destroyed by the Germans, is at a New York hotel and is getting quotations on a complete plant equipment for the manufacture of automobiles, motorcycles and bicycles. The list includes 52 engine lathes, from 12 to 24 in.; 23 crank shapers, three centering machines, nine milling machines, three turret lathes and other tools. The Belgo-American Corporation, affiliated with Alcorn, Blockhouse & Co., 1418 Walnut Street, Philadelphia, engineers, is obtaining quotations on several hundred tools for shipment to Belgium. The list includes 100 drilling machines. This concern inquired for about 50 machines a few weeks ago, which so far as reported have not been bought.

Another export inquiry comes from the J. G. White Engineering Corporation, 43 Exchange Place, New York, for shipment to Columbia, South America. Quotations are asked for on one No. 2 universal milling machine, power hack saw, 24 in. vertical drilling machine, 2 in. single bolt cutter and a double-end punch and shear.

The S. K. F. Ball Bearing Co., Hartford, Conn., contemplates the erection of a plant for the manufacture of hangers for shafting adjoining the factory of the Hess-Bright Mfg. Co., Philadelphia, and is obtaining quotations on complete machine shop equipment. A foundry is also to be built. The equipment will be bought from the New York office of the company, 5 Nassau Street.

The Standard Oil Co. of New Jersey will buy considerable equipment during the next few months, including shipyard machinery for a shipbuilding plant, which it is reported will be established in North Europe, probably in Norway. Its immediate requirements include tools for a ship repair shop at Bayway, N. Y., this list having been published in the April 3 issue of THE IRON AGE. Since that time additional inquiries have been sent out calling for quotations on two 28 in. shapers, one 20 in. crank shaper, one No. 3 universal milling machine for the Bayway shop. A new refinery at Charleston, S. C., will require one 24 in. shaper, one 36 in. planer, a milling machine and three engine lathes, 18, 24 and 36 in. Purchases have not been made on the large list which the Standard Oil Co. of New Jersey issued several weeks ago for shipment to Rumania. It is reported in the trade that action on this list will be delayed several weeks longer.

The French High Commission, which recently began the placing of large orders for machine tools, totalling close to \$1,000,000, has suspended all purchasing, and it is probable that no further action will be taken until after the peace treaty has been concluded.

An announcement relative to the expansion plans of the General Motors Corporation has greatly interested the machine-tool trade inasmuch as a large portion of the appropriations for extensions to plants will be spent for equipment. In fact, the purchasers of the General Motors Corporation since the war ended have probably exceeded those of any other manufacturing interest. President W. C. Durant states that \$37,398,000 has been appropriated for various plants as follows: Detroit, \$12,650,000; Flint, \$6-

712,000; Pontiac, \$2,150,000; Lansing, \$2,450,000; Saginaw, \$2,427,000; Toledo, \$543,000; St. Louis, \$4,135,000; Janesville, Wis., \$4,500,000; Bristol, Conn., \$1,078,000; Muncie, Ind., \$300,000. A new plant will be built at Walkerville, Ont., for the Cadillac Motor Car Co. division. The cost, including equipment, will reach \$6,000,000. A newspaper report from Boston is to the effect that Henry Ford has acquired a 26-acre site at South Boston, presumably for a new plant. No details have been announced.

Few crane orders are being closed, but inquiries show some improvement. The Standard Oil Co. of New Jersey is inquiring for eight cranes, four overhead, two wall and two jib cranes. The Henry R. Worthington Co., New York, is getting bids on two cranes for its Harrison, N. J., works. A manufacturer of grab buckets will reduce prices 10 per cent.

Locomotive crane builders have work ahead for about three months in completing contracts placed during the war, but new business has developed very slowly since the war ended, the actual orders placed in that time being less than 10 per cent of the capacity of the plants, which now totals about 110 a month. Only about 40 locomotive cranes have been bought in the entire country since the war ended, and some of these are on allocations made by the crane committee in Washington prior to November 11, last.

The Zionist Society of Engineers and Agriculturalists, 122 East Thirty-seventh Street, New York, which is engaged in planning and budgeting the mass-colonization of Palestine, desires the co-operation of American manufacturers so that it may be in a position to select and recommend the subsequent purchase of materials, tools, machinery and other equipment to be used in reclamation work in Palestine. An engineering commission is soon to be sent by the society to Palestine to make a survey of the natural resources of that country with a view to their development along modern lines. Manufacturers are invited to send literature and other information to the office of the society.

A water system is planned for the city of Macassar on the island of Celebes in the Netherlands East Indian Archipelago, for which the cost is estimated at over \$400,000. Information may be obtained of the Intelligence Office and Produce Sample Room of the Netherlands Indian Government, 11 South William street, New York. J. H. Muurling is in charge.

The General Carbonic Co., Albany, N. Y., which operates a plant at 444 Van Brunt street, Brooklyn, is having plans prepared for the first unit of its proposed works on Sixth street, Long Island City, N. Y., to cost \$400,000. It proposes to build a works to cost about \$200,000.

C. Mareucci, 135 West Third street, New York, manufacturer of tin cans, etc., has had plans prepared for a two-story brick plant, 25 x 150 ft., to cost \$25,000.

The Shore Instrument & Mfg. Co., 557 West Twenty-second street, New York, manufacturer of measuring instruments for engineering use, has purchased property, about 217 x 285 ft., on Van Wyck avenue, near Fulton street, Jamaica, Long Island, for a new plant.

The Newsbox Sales Corporation, New York, has been incorporated with a capital of \$300,000 by O. Blauert, F. A. Maufus and E. J. Stenson, 243 West 107th street, to manufacture metal vending and slot machines.

The Wappler Electric Mfg. Co., 173 East Eighty-seventh street, New York, manufacturer of x-ray equipment, etc., is considering the erection of a three-story reinforced-concrete plant on Harris avenue, Long Island City. The company, it is reported, proposes to locate its main works at this location, consolidating its existing plants.

The Johnson Casting & Mfg. Co., 619 Kent avenue, Brooklyn, has increased its capital from \$10,000 to \$45,000.

Property of the J. M. Lehmann Co., 101 Varick street, New York, manufacturer of confection manufacturing machinery, will be sold by Francis P. Garvan, Allen Property Custodian, on April 22. The company operates a shop at 12 Eighth street.

The J. W. Richardson Foundry & Metals Corporation, Brooklyn, has been incorporated with a capital of \$15,000 by J. W. Richardson, T. F. Vandorn and M. Halsted, 400 West 151st street.

J. B. Linahan, formerly with the National Casket Co., Long Island City, has leased a factory building at East 128th street and Exterior street, and will establish a plant for the manufacture of caskets.

The E. S. Electro Galvanizing Co., 32 Stockton street, Brooklyn, has leased a four-story factory at 36 Stockton street, 19 x 50 ft., for a new works.

The Aborn Steel Co., 22 Clarke street, New York, has purchased adjoining property, 25 x 90 ft., for extensions. J. T. Stogsy is president.

The J. Bryant Olds Co., Maspeth, Long Island, has been incorporated with a capital of \$70,000 by R. I. Guthman,

I. B. Camfield and R. A. McLearn, 115 Broadway, to manufacture motor parts.

The Deep Drawn Metal Co., 195 Plymouth street, Brooklyn, is planning the resumption of operations on drawn-steel stampings for automobile service. Since its establishment early in 1918, it has been devoted to the production of booster casings for 8-in. and larger shells for the Government. W. A. Donald is plant manager.

The city of New York has filed plans for a one-story forge shop, 20 x 50 ft., on Ninety-first Street, near Avenue A, for municipal service. F. H. Hines, Municipal Building, is architect.

The Fred Roeder Mfg. Co., 1396 Atlantic Avenue, Brooklyn, manufacturer of commercial bodies for automobiles, has filed plans for a two-story brick addition, 25 x 92 ft.

The Bell Locomotive Works, Inc., 11 Pine Street, New York, manufacturer of industrial locomotives, is considering the removal of its plant from Lincoln, N. J., to Bloomsburg, Pa. It is understood that in connection with this proposed change the present plant capacity will be increased. The company recently filed articles of incorporation in Delaware with capital of \$450,000. Prescott Warren is president.

Bennett & White, Inc., 67 Goble Street, Newark, N. J., manufacturer of music rolls, is planning to rebuild its plant destroyed by fire, with loss, including machinery and equipment, of about \$50,000. Meanwhile it will establish a temporary local plant.

The Vreeland Motor Co., Newark, N. J., has been incorporated with a capital of \$500,000 by E. E. Vreeland, Bridgewater, Long Island; S. D. Weaver, Concord, N. H., and J. J. Hopkins, South Orange, to manufacture automobiles and motor parts.

The Roder & Bedell Co., 168 Somerset Street, Newark, N. J., has filed notice of organization to operate a machine shop and auto repair works. John J. Roder, 549 Clinton Avenue, and George E. Bedell, 371 Belmont Avenue, head the company.

The American Aluminum Ware Co., 374 Jelliff Avenue, Newark, N. J., has had plans prepared for a three-story addition, 38 x 50 ft. Christian Schmidt is president.

The Ford Motor Car Co., Detroit, Mich., has commenced manufacturing operations in the units of its new works at Kearny, N. J., now completed, and it is understood that employment is being given to about 1800 men. The main assembly building, 900 ft. long, has recently been placed in service. Construction work is well under way on a new main four-story building, 350 x 900 ft., to be used for manufacturing.

The Mercury Steel Products Co., 256 Broadway, New York, has increased its capital to \$25,000.

The Pigot Sayre Co., 71 Front Street, New York, manufacturer of lubricating oils, etc., has acquired property at the foot of Sullivan Street, fronting on the East River, Brooklyn, as a site for a plant.

The Downey Shipbuilding Corporation, Arlington, Staten Island, N. Y., has completed about three-fourths of its contract with the Emergency Fleet Corporation for the construction of 10 7500-ton steel vessels, and is planning to devote its steel hull and marine engine departments to the building of steel ships for private interests. Following the completion of the Government work it is proposed to establish production at the rate of one steel vessel a month.

The Coburn Trolley Track Mfg. Co., Holyoke, Mass., has leased property at 44-46 Duane Street, New York, for a new local establishment.

Buffalo

BUFFALO, April 7.

The Fancher Flexible Shaft Co., Baldwinsville, N. Y., is preparing plans for a plant which will be erected this summer.

The Douglass Packing Co., Fairport, N. Y., Robert Douglass, president, 6 North Main St., will build a machine room addition to its plant of brick and steel, to cost \$30,000.

The Williams Co., Syracuse, N. Y., is receiving proposals for a gate shear 13 x 15 x 45 to 60 in., belt driven and completely equipped.

The recently organized J. A. Bort Mfg. Co., Fulton, N. Y., has acquired the plant of the Simplex Wrapping Machine Co., and will equip it for the manufacture of plumbers' couplings, unions and valves. Later the company expects to build a larger plant.

The Lake Erie Welding & Spring Co., Erie, Pa., has completed plans for a factory, 30 x 100 ft. New equipment will be required, including a 5-ton hoist.

Plans are being prepared by the Erie Malleable Iron Co., Erie, Pa., for a four-story addition, 40 x 60 ft., to its plant.

The Empire Axle Co., Dunkirk, N. Y., has been incorporated with a capital of \$400,000 by C. J. Parker, Jr., H. E. Newell and H. J. Crane, Syracuse, to manufacture axles, etc.

The St. Lawrence Transmission Co., Potsdam, N. Y., subsidiary of the Aluminum Co. of America, Pittsburgh, has increased its capital from \$525,000 to \$3,000,000, for proposed extensions in its electric system. F. A. Stoughton is president.

The Fractionator Corporation, Rochester, N. Y., has been incorporated with a capital of \$250,000 by C. L. Reed, H. L. Marsh and C. Wheeler, to manufacture instruments and equipment for automobiles.

New England

BOSTON, April 7.

The bulk of business seems on the increase, but very unevenly distributed, plants within short distances of each other and making similar products reporting widely differing conditions and conclusions. One maker of motorcycles had 2500 employees busily at work and reported sales for export supplementing in very satisfactory amounts the domestic orders, a recent shipment being to Sweden, which country is also heard from elsewhere as a purchaser of other machines and raw materials. A Hartford machine tool manufacturer claimed that if orders continued for another month as in the preceding 60-day progress, the plant would be producing at the rate immediately prior to our entrance into the war. Good reports were also voiced by makers of trucks, presses, chucks, etc., the chuck manufacturer having retained his old force of employees and incidentally mentioning that orders had of late arrived from Switzerland and France. The Pratt & Whitney Co. has had some European agents calling at the home office in Hartford, and in particular were impressed by the prospects of business from Italian sources. On the other hand, the Draper Co., Hopedale, Mass., builder of machinery for cotton mills, has cut another hour from the working day, a time reduction involving some 2000 employees.

The Ingraham Clock Co., Bristol, Conn., has signed up for the erection of an additional building for its movement factory for clocks and watches. The new structure will be 50 x 100 ft., five stories, and cost some \$70,000. The plant is now running full time.

The sum of \$1,028,000 has been announced for expenditure on additional buildings and other improvements at the plant of the New Departure Mfg. Co., Bristol, Conn. Work is already under way on some new buildings and the further extensions contemplated will be speedily started in order that in from three to four months considerable progress toward finishing up the undertaking may be made.

The Ship & Engine Co., Groton, Mass., has contracted for the building of an addition, one story, 60 x 72 ft.

Contract has been awarded for the erection of a \$75,000 factory building at the plant of the Raybestos Co., Stratford, Conn. The structure will be of brick and steel, one story, 160 x 170 ft.

The Central Oil & Gas Stove Co., Gardner, Mass., will make some additions and alterations to its plant of brick, concrete and steel construction, one story, 50 x 120 ft., and three stories, 40 x 50 ft.

The Providence Ice Co., Providence, R. I., is building an artificial ice plant, 90 x 135 ft., at a cost of \$20,000.

The general contract is awarded for the building of a machine shop, \$15,000, one story, 45 x 135 ft., for Henning Brothers, New Haven, Conn.

The Greenman Steel Treating Co., Worcester, Mass., has broken ground for a new factory, brick, one story, 40 x 80 ft., \$7,000.

Bids have been received for the building of a factory addition of reinforced concrete, three stories, 100 x 372 ft. and 35 x 162 ft., at the plant of the National Equipment Co., Springfield, Mass.

The Worcester Pressed Steel Co., Worcester, Mass., manufacturer of pressed metal products, is considering the construction of a one-story rolling mill extension to its plant, 90 x 150 ft., with electrically-operated equipment.

The Architectural Bronze & Iron Co., 25 Day Street, Providence, R. I., has filed notice of organization to manufacture ornamental iron and bronze products. Frank L. Kneupfer, 29 Dixon Street, and Joseph F. Farrell, 52 Daboll Street, head the company.

The Norton Co., Worcester, Mass., manufacturer of abrasive materials, is arranging for the manufacture of a new non-slip tile for floor service. It will be made from alundum,

and will be produced in three sizes, ¼-in. thick and heavier. It is proposed to establish a department for this specialty.

The Parmenter-Graves Co., Springfield, Mass., has been incorporated with a capital of \$50,000 by Edward S. Parmenter, R. W. Graves and R. E. Parmenter, to manufacture motor products, parts, etc.

The Shaffer Marsh Co., 116 Ann Street, Hartford, Conn., has filed plans for the erection of a new one-story pipe shop to cost about \$6,000.

The H. & H Foundry Co., Stamford, Conn., has taken bids for the erection of its proposed new one-story plant, 60 x 200 ft., on Pacific Street; the lowest estimate of cost totals \$76,900.

The Stove Facing Mfg. Co., Providence, R. I., has filed notice of organization to manufacture stove and heater trimmings and specialties. Wilfred J. Beaugregard, 390 Smithfield Street, Pawtucket, heads the company.

Following the Government order canceling the construction of a proposed new battleship at the plant of the Fore River Shipbuilding Co., Quincy, Mass., the operating force at the plant has been reduced by about 2,000 men, effective March 31.

The Perfect Rubber Works, Stamford, Conn., has filed notice of organization to manufacture rubber products. L. C. and C. E. Apt, 11-13 Garden Street, head the company.

The Woodland Machine Co., Worcester, Mass., has been formed by Earl H. Knowlton, 10 Cleveland Avenue, and Bernard MacKenna, Shirley Terrace, to operate a general machine shop at 145 Woodland Street.

Pittsburgh

PITTSBURGH, April 7.

With the reopening and operation of the Alicia No. 2 Mines, Uniontown, Pa., recently acquired from W. Harry Brown, the Pittsburgh Steel Co., Pittsburgh, is planning for the erection of a new boiler plant and mechanical fan house.

The Andrews Construction Co., Bessemer Building, Pittsburgh, has commenced the erection of a new one-story machine shop and works building, 60 x 160 ft., at New Kensington, Pa.

The A. W. Miller Co., Pittsburgh, has been incorporated with a capital of \$10,000 by H. L. Dietrich and associates, to manufacture piping and other plumbing specialties.

S. W. Rubin has awarded a contract to the D. T. Riffe Co., Pittsburgh, for the erection of an additional story on the six-story building on Seventh Street, near Penn Avenue, recently acquired, for the establishment of a machine repair works and automobile service station. The extension is estimated to cost in excess of \$100,000, and will provide a total of about 59,400 sq. ft. in the entire building for different operating departments.

The Remmen Gas Engine Corporation, Pittsburgh, has been incorporated with a capital of \$5,000 by D. E. Mitchell and associates to manufacture gas engine equipment.

W. S. King, Spencer, W. Va., is planning for the immediate establishment of a machine shop and boiler works in a two-story building, 50 x 120 ft. Machinery for all departments will be installed, including steel tank production, boiler repairs, etc. The initial works will cost about \$8,000.

The Beckley Hardware & Supply Co., Beckley, W. Va., is considering the erection of a new three and four-story building, 40 x 100 ft.

The Hi-Glo Co., Wheeling, W. Va., has been incorporated with a capital of \$50,000 by Carl O. Schmidt, Henry L. and Herman L. Arbenz, to manufacture electric signs and other metal illuminating displays.

The Pittsburgh Visible Spark Plug & Mfg. Co., 460-48 Melwood Avenue, Pittsburgh, has increased its facilities to provide for greater output of visible spark plugs. With the engineering department working on other new inventions it is proposed to develop different departments for special productions.

The Central Electric Tool Co., Pittsburgh, has been incorporated with a capital of \$5,000 by John A. Metz, Turmont, and associates, to manufacture tools, etc.

The George W. Ziegler Machinery Co., 515 First Avenue, Pittsburgh, is planning for the early erection of a one-story top addition to its building, 40 x 80 ft.

The Triangle Tool Co., Erie, Pa., manufacturer of tools, etc., has increased its capital from \$30,000 to \$60,000.

The Mount Hope Coal & Coke Co., Mount Hope, W. Va., is considering plans for the rebuilding of its coal tipple recently destroyed by fire.

Philadelphia

PHILADELPHIA, April 7.

Extensive improvements are now in progress at the plant of the York Mfg. Co., York, Pa. The pipe shop is being enlarged and a malleable iron foundry, core shop and paint and oil shop are to be added. Additional equipment will be needed.

Ground has been broken at York, Pa., for a chain plant for a company to be known as the Victory Chain & Mfg. Co. Its promoters are Samuel M. Horn, formerly of the Diamond Chain Co., Ralph Horn and Ralph Nace. Application for a charter will be made within a few days. The company will manufacture chain of all descriptions, light and heavy, ship and commercial. Heavy and light machinery necessary for the manufacture of the chain will be needed.

The Finch Mfg. Co., manufacturer of brass and steel castings, Scranton, Pa., is planning this summer for an addition to its machine shop, 100 ft. long, three stories, for increased operations. Planers, drill presses, generators, milling machines, compressed air apparatus and an additional crane will be needed. Eugene F. Marsh is president.

The Merchant Shipbuilding Corporation, Bristol, Pa., has denied the report that its shipyard would be closed to arrange for works adjustments. It is expected to maintain operations with current working force until after Oct. 1, at the earliest.

The Topliff-Fly Co., Washington, Pa., manufacturer of sleds, children's carriages, etc., has increased its capital from \$300,000 to \$500,000.

The East Penn Foundry Co., Macungie, Pa., recently incorporated to operate an existing local foundry, has increased the capacity of the plant, with plans for still further enlarged output as business develops.

In connection with its proposed hospital buildings, the Western State Hospital for the Insane, Samuel S. Richard, Altoona, Pa., chairman of the board of directors, a power plant, electric motors and considerable mechanical equipment will be installed. The new institution will be located at Terrance, near Blairsville, Pa., and is estimated to cost close to \$2,000,000. Charles S. Schwartz, Blairsville, is engineer.

The Perseverance Iron Foundry Co., Ltd., Passyunk Avenue, Philadelphia, will rebuild the portion of its foundry recently destroyed by fire. Machinery and patterns were destroyed in the fire.

The Kennedy Garage & Machine Works, 318 Market Street, Trenton, N. J., is planning a one-story machine repair works addition to cost about \$10,000.

J. R. Staub, 219 East State Street, Trenton, N. J., manufacturer of automobile bodies, is considering the erection of a one-story addition, 50 x 150 ft.

The Media Garage, 36 East State Street, Media, Pa., is taking bids for a one-story addition to increase its repair and machine departments. It will be 27 x 80 ft., and 30 x 30 ft. and is estimated to cost \$10,000.

The Wilmot Engineering Co., Hazleton, Pa., manufacturer of coal jigs, castings, etc., has increased its capital from \$45,000 to \$170,000. It operates a plant at White Haven. G. W. Wilmot is president and general manager.

Detroit

DETROIT, April 7.

The Detroit Motors Parts Co. has been organized with offices at 212 New Telegraph Building, Detroit. E. F. Wilkinson is president; F. M. Keeton, vice-president, and R. H. Merrill, secretary-treasurer. The company has a capital stock of \$40,000 and will produce piston rings and shafts for passenger cars, trucks and tractors.

The Detroit Culto-Tractor Corporation, Detroit, recently organized and capitalized at \$1,500,000, will shortly place on the market a tractor to sell for \$750. Production on the first thousand has been started. H. M. Jerome, formerly chief engineer of the Allis-Chalmers Mfg. Co., is production manager and vice-president. S. R. DuBrie is chief engineer and secretary, Joseph Rowe president and E. H. Kramer treasurer.

The Buick Motor Co., Flint, Mich., will erect a new machine shop on Hamilton Avenue. The building will cost \$100,000 and its equipment \$100,000.

The Great Lakes Foundry Co., Port Huron, Mich., plans to increase its working force within the next six weeks to triple its present output. The manufacture of Ford tractor parts will keep the plant running at capacity for months to come. A modern conveying system is being installed in the foundry.

Plans for a foundry building for the Muskegon Tool & Shoring Co., Muskegon, Mich., have been completed. It

will be 45 x 80 ft., of mill construction, and will be replaced later by a steel and concrete building.

The American Machine Products Co., Twenty-first Street, Detroit, is having plans prepared for the erection of a new one-story works, 48 x 100 ft., at Eighteenth and Howard streets.

The General Motors Corporation, Detroit, has announced its intention of expending an appropriation of \$37,000,000 during the present year for extensions at its different plants to increase the present output of automobiles and for improvement in general operating facilities. Of this budget, it is proposed to make extensions and betterments in the Detroit and other plants in Michigan to cost about \$26,000,000, while an amount of \$1,028,000 has been arranged for expansion at the Bristol, Conn., plant of the corporation.

The Bush & Lane Piano Co., Holland, Mich., is planning for the erection of a three-story and basement addition, 80 x 250 ft., to cost \$50,000.

The Michigan Boiler & Sheet Iron Works, 842 Jefferson Avenue, Detroit, has had plans prepared for the erection of a new boiler house.

The B. & H. Machine Products Co., Detroit, is considering the establishment of a new works to replace its plant destroyed by fire on March 22, with loss estimated in excess of \$10,000.

Baltimore

BALTIMORE, April 7.

The Baltimore Marine Iron Works, Inc., Clement and Woodall streets, Baltimore, has been incorporated with \$50,000 capital stock to repair ships or to build and repair marine or stationary boilers. The incorporators are Howard C. Crovo, Harvey A. Stambaugh, Alfred E. B. Burns, Edward L. Seidl, Jacob Clay and E. Arch Seidl.

The American Marl & Fertilizer Co., Richmond, Va., has been organized and plans are being made to construct a plant at a cost of \$60,000. C. D. Gilliam is manager.

The Jones-Boardman Corporation is reported to have acquired the buildings of the Viaduct Mfg. Co., Relay, Md., and after making improvements will manufacture textile machinery, forgings and castings, employing about 400. The plant includes three factory buildings and two warehouses, giving a total floor space of about 60,000 sq. ft. Ebbert A. Jones, secretary, is the inventor of many of the articles which it is said will be manufactured. The other officers are T. V. Boardman, president and treasurer; G. T. Strother, vice-president. Randolph Barton, Sr., Baltimore, is a member of the board of directors.

The S. B. Sexton Stove & Mfg. Co., Baltimore, has purchased from the Bartlett Hayward Co. its complete stove business, consisting of patterns, trademarks, good will and stock of ranges, furnaces, and parts, etc. The Sexton company will continue the manufacture of these lines in addition to its regular product. W. Elbert Sexton is president.

In connection with the incorporation of the Baltimore Marine & Iron Works, Inc., Woodall and Clement streets, Baltimore, a machine and boiler shop will be established. Equipment, including 150-hp. in motors, will be installed.

Levering Brothers, Key Highway and William street, Baltimore, manufacturers of gray-iron and brass castings, sash weights, etc., have purchased the plant built by the Government at Buffalo, N. Y., for the Pierce-Arrow Motor Car Co. for testing airplane motors. The plant will be used for making gray-iron castings, but no specializing will be done at present. In addition to the Baltimore plant the company has plants at York and Hanover, Pa. It is in the market for cupolas and complete foundry equipment for the Buffalo plant. Wilson K. and Ernest D. Levering are the proprietors.

Oliver B. Rutherford, 104 Dolphin street, Baltimore, will build a one-story machine shop, 19 x 24 ft., for automobile repair work.

The Poole Engineering & Machine Co., Baltimore, is contemplating the use of the plant of the Maryland Pressed Steel Co., Hagerstown, Md., a subsidiary, as an airplane factory, to build machines for pleasure and commercial use. The plant has turned out a small machine, which is said to have proved successful, and because of its size is capable of landing in a country road. S. Proctor Brady, Baltimore, is president of the Poole Engineering & Machine Co.

H. M. Bramberry, Norfolk, Va., who will establish an automobile repair shop, contemplates building a plant to cost about \$25,000. Considerable machinery will be installed and prices are wanted on cranes, portable tools, lathes, drill presses and other equipment.

Hackley Morrison, Richmond, Va., wants prices on 150-hp. return tubular boilers, with fittings, and second-hand bolt-threading machines.

H. E. Naylor, Front Royal, Va., wants prices on 150-hp. Corliss steam engines.

G. Gentry, Railway & Power Building, Richmond, Va., is seeking prices on second-hand 200-kw. generating sets and locomotive wheel lathes.

W. S. King, Spencer, W. Va., plans to install boiler and machine shop equipment for repair work, etc.

The Fairmont Tool Co., Fairmont, W. Va., contemplates building a plant for the manufacture of miners' tools, etc.

The city of Benson, N. C., will build an electric light plant. L. Gilbert is town clerk.

F. E. de Golian Co., Atlanta, Ga., contemplates the construction of a plant for the manufacture of ornamental iron and steel.

The Lakeland Lumber & Supply Co., Lakeland, Fla., wants prices on 100-hp. boilers.

The Joubert-Goslin Machine & Foundry Co., Birmingham, Ala., will build additions to its plant at a cost of about \$35,000.

A one-story boiler plant, 45 x 25 ft., to cost \$10,000, will be erected by the Standard Oil Co., Baltimore, on First avenue, near Fifth street.

The machinery equipment and construction plant of Irwin & Leighton, 126 North Twelfth street, Philadelphia, at Sparrows Point, Md., being used in connection with the erection of the new plate mill at the plant of the Bethlehem Steel Co., was partially destroyed by fire recently, with loss estimated at \$25,000.

The Virginia Iron Works, Water street, Norfolk, Va., has inaugurated construction on a one-story machine shop to cost about \$6,000.

The Newport Shipbuilding Co., Los Angeles, Cal., with office at Washington, D. C., has awarded a contract to the Diamond Steamboat & Wrecking Co., Wilmington, N. C., for initial construction work for its proposed shipbuilding plant at Newbern, N. C., which will be equipped to manufacture steel and wood vessels.

McCoy Brothers, West Palm Beach, Fla., are considering the purchase of local waterfront property as a site for a shipbuilding plant.

Machinery for automobile repair work will be installed in the building, 50 x 50 ft., to be erected by the Bear Poplar Garage Co., Bear Poplar, N. C., recently organized. C. F. Houck is president.

Milwaukee

MILWAUKEE, APRIL 7.

A slight but gradual improvement in the machine tool business has been noted by local manufacturers the past week or ten days, consisting mainly of an increasing number of inquiries, some of which are of relatively large proportions. Buyers are deliberate in actually placing orders, however, and the waiting attitude still exists. A canvass of manufacturers indicates that while some shops are booking a liberal volume, others find little encouragement in the situation.

Milling machine business is growing better and local shops are being kept fairly busy. The automotive industries continue the heaviest buyers of this class of equipment.

The local labor situation is quiet, but at Madison a strike was declared by machinists on April 1, and about 1800 men walked out, crippling operations in seven out of nine shops. There has been no disorder and it is believed that the trouble will be settled amicably within a few days. The strike grew out of the award made recently by the War Labor Board, granting an 8-hr. day, higher pay, and the right of collective bargaining, with back pay from Aug. 1, 1918, on the new scale.

The Sterling Wheelbarrow Co., Milwaukee, has broken ground for a one and two-story addition, 125 x 300 ft., to its plant at Sixty-fourth and Pullen avenues, West Allis. The project is in charge of Klug & Smith, Mack Block, Milwaukee, consulting and erecting engineers. The building will be of brick, steel and concrete, with steel sash, and will cost \$50,000 without equipment. The Sterling company manufactures wheelbarrows, foundry flasks and other foundry, machine shop and industrial accessories. Irving R. Smith is president and general manager.

The Badger Aluminum Co., Sheboygan, Wis., has been incorporated with a capital stock of \$50,000 to manufacture aluminum drawn ware. The incorporators are William A. Erdmann, William H. Toepel and William Markwardt. It is intended to begin work about April 28 or May 1 on the erection of the first unit of the proposed new plant, which will cost about \$35,000 with equipment. The architects are Juul & Smith, Sheboygan.

The Four Wheel Drive Auto Co., Clintonville, Wis., manufacturer of motor trucks, at a special meeting of stockholders voted to form a new corporation with an initial capital stock of \$200,000 to establish a branch plant at Kitchener, Canada. The new plant will be largely an assembling shop, the parts to be furnished from the main works at Clintonville. Plans for the new works are in preparation and will involve an investment of about \$150,000.

A report from Racine, Wis., states that the former plant of the Wisconsin Engine Co., defunct, at Cortiss, has been leased for five years by the Emergency Fleet Corporation. Confirmation of the report is lacking, however. The plant is equipped for the manufacture of steam and oil engines and other power plant equipment. It has been idle for several years.

The Northern Foundry Co., Marinette, Wis., manufacturer of gray iron castings, has closed a large contract with the Oakland Motor Car Co., Pontiac, Mich., for gas engine castings, work on which was undertaken this week. The company also has booked orders for parts from a number of other automotive industries, making it necessary to add from forty to fifty men to the working force at once. Louis Rasmussen is general manager.

The Simple Gas Engine Works, Neenah, Wis., has started work on a new plant which is estimated to cost about \$20,000. Some new equipment will be purchased. The company intends to enlarge its output of stationary and portable gas engines and also build tractor and automobile power units. F. J. Oberweiser is president.

The Maas Carbonator Co., 250 West Water Street, Milwaukee, manufacturer of self-contained water carbonating units for soda fountains, will award contracts this week for the erection of a plant, 60 x 100 ft., one story, on Clybourn and Twenty-second streets. It will be of reinforced concrete and brick, with metal sash and with equipment will cost about \$30,000. Adrian Fontaine is vice-president and general manager.

The Blackmarr Machine Co., Bayfield, Wis., has increased its capital stock from \$25,000 to \$50,000 to finance enlargement of its plant and output of steam and gas-powered machines for pulling stumps, decking logs, heavy moving, hoisting, etc. A small list of new equipment is being purchased. F. N. Blackmarr is general manager.

The Pelton Steel Co., Milwaukee, is moving its plant and equipment from Chicago Road and Elliott Place, where it has been operating for several years, to a larger plant at Kinnickinnic Avenue and Mitchell Street, which it also owns. The transfer is being made to take advantage of better facilities for more economical production and involves no immediate enlargement of output or purchase of new equipment. The Chicago road plant probably will be sold. In the Kinnickinnic plant the Pelton company will have available one 10-ton and one 20-ton open-hearth furnaces and two 1½-ton Snyder electric furnaces. William H. Schuehardt is vice-president and general manager.

The Turbine Sewer Machine Co., 195 Eleventh Street, Milwaukee, will build a two-story addition, 30 x 60 ft., to provide additional machine shop facilities. Equipment has been purchased. Philip A. Fuchs is president.

Kelsey, Brewer & Co., Grand Rapids, Mich., owning and controlling more than 10 hydroelectric and steam generating plants in Wisconsin and eastern Minnesota, will establish an electrically operated coal dock at Manitowish, Wis., at a cost of between \$150,000 and \$200,000. It will be used exclusively for handling the fuel supply of the Kelsey-Brewer properties in this territory. Gaylord C. Cummings is in charge of design and construction of the new dock.

The Ashland Dairy Products Co., Ashland, Wis., will spend about \$75,000 for remodeling the plant of the Ashland Brewing Co. into a cold storage warehouse and the installation of much new machinery, refrigeration and other equipment. The work is in charge of Henry Wildhagen, architect, Ashland.

The United States Tractor & Machinery Co., Menasha, Wis., has awarded the contract for the erection of the first unit of its new plant to C. R. Meyer & Sons Co., Oshkosh, Wis. It will be 60 x 125 ft., of brick and steel, with metal sash, and a separate office building, 25 x 50 ft. The site is at Sixth and Tayco streets, and embraces a tract measuring 202 x 750 ft. H. C. Berry is chief engineer.

The Jenkins Machine Co., Sheboygan, Wis., has plans for a one-story brick and steel machine-shop addition, 40 x 190 ft., at 315 North Eighth Street. The architects are Juul & Smith.

C. Milhaupt & Sons, Appleton, Wis., have started construction work on a one-story machine shop and force plant, 50 x 70 ft., adjoining the present shop. The firm does general machine repairs and makes and repairs motor vehicle springs and similar work.

The Carl Hartmann Dry Dock Co., Green Bay, Wis., will

will soon for the construction of a floating dry dock costing about \$400,000 and consisting of twelve 50-ft. sections, each 60 ft. wide. It will be constructed of reinforced concrete and steel, in sections. The consulting engineers are Morrison & Beck, 140 South Dearborn Street, Chicago.

The Badger Show Case Co., 138 North Pearl Street, Green Bay, Wis., has plans for a two-story addition, 40 x 85 ft. J. R. Breckner is manager.

The Board of Education, Milton, Wis., has authorized the purchase of a site for a new high school and will select an architect soon. A manual training department will be included in the plan.

The Wetmore Mechanical Laboratory Co., 210 Sycamore Street, Milwaukee, has changed its corporate style to the Wetmore Reamer Co. It has completed its contracts with machine makers, to whom it supplied expanding reamers, hole taps, lathe and boring bar tools, and has resumed its former tool business, specializing in a type of expanding reamer. More floor space has been added and the offices enlarged. P. H. Dorr, recently released from the Government service, secretary and sales manager, is a new member of the organization.

Lockwood, Greene & Co., industrial engineers, 38 South Dearborn Street, Chicago, are completing plans for additional plants for the Aluminum Goods Mfg. Co., Manitowoc and Two Rivers, Wis., which will involve a total cost of approximately \$1,140,000. The improvements include a five-story, reinforced-concrete building, 160 x 280 ft., at Manitowoc to cost \$600,000, and three structures at Two Rivers—a three-story factory, 50 x 320 ft., to cost \$250,000; a four-story plant, 60 x 300 ft., \$250,000, and a three-story building, 41 x 137 ft., \$40,000.

Cleveland

CLEVELAND, April 7.

A moderate volume of machine-tool business continues in small orders, which are fairly well distributed. Buyers include manufacturers of automobile parts, marine engines, stampings, and makers of steam pumps. The steam pump industry is becoming more active, and some pump manufacturers are adding to their equipment. Little new demand has come out the past two or three weeks from the automobile industry, although two manufacturers in Michigan are figuring on considerable additional equipment. One local machinery house received orders from several Detroit manufacturers for about 25 machines aggregating \$37,000. Builders of screw machines and turret lathes report a moderate volume of scattering orders, mostly for single machines. A new inquiry has come from Sweden for 30 turret lathes, and orders for several lathes were received the past week from England, France and Belgium.

Second-hand machinery is moving fairly well, but some complaint is coming from owners who are unable to place used machinery on the market because they have as yet been unable to secure adjustments from the Government.

The demand for punching and shearing machinery shows some improvement. Two inquiries, each for about a half dozen machines, have come from car builders, and some new inquiry is developing from boiler and fabricating shops.

Manufacturers of chain hoists report an increase in the volume of business, which is now very satisfactory. Manufacturers are guaranteeing to dealers prices of hoists up to July 1.

The Lubrication Engineering Co., Cleveland, has been organized to build a commercial oil reclamation plant and install industrial oiling systems. The company is composed of W. J. Otteinger, formerly with the Wayne Oil Tank & Pump Co., who served with the Aviation Corps as engineer, and developed a process for reclaiming used motor oil, and Oscar Steiner, who during the war served in the Chemical Warfare Service on gas research work at the American University in Washington.

The Lakewood Engineering Co., Cleveland, will remove its Galion, Ohio, plant to its main plant in Cleveland, and the quarters occupied in Galion will be used by the Galion Metallic Grave Vault Co.

The Arco Co., East Seventy-ninth Street and Bessemer Avenue, Cleveland, plans to erect a machine shop addition.

The W. S. Bidle Co., Cleveland, which is engaged in commercial heat treating work, has placed contracts for the erection of a one-story addition, 50 x 100 ft. An extension to its machine shop, 40 x 90 ft., will also be erected.

The Standard Parts Co., Cleveland, has acquired the plant of the A. B. C. Castings Co., 6515 Carnegie Avenue, and will use it in connection with its perfection spring and heater division.

The equipment of the screw machine department of the

Toledo Screw Products Co., Toledo, Ohio, is being placed on the market by the Cleveland Duplex Machinery Co., Cleveland, which has purchased the entire equipment, consisting of 65 automatic machines, 12 hand screw machines, and a large number of tappers, hand milling machines, etc.

The Reliance Mfg. Co., Massillon, Ohio, maker of lock washers and nut locks, will build an addition, 60 x 100 ft., and will install eight additional blocks for wire drawing and cold drawing of steel. Orders have been placed for the drawing blocks and additional furnaces, pickling equipment, etc.

The National Supply Corporation, Toledo, Ohio, has acquired the plant of the Dayton Pipe Coupling Co., Dayton, Ohio, which is engaged in the manufacture of oil and pipe line supplies, special fittings and forgings. W. W. Price, formerly president of the company, has resigned, and has been succeeded by Frank Collins, Toledo. S. W. Miner has been re-elected vice-president; Charles R. Clapp, formerly treasurer, is secretary and treasurer, and J. H. Horne is general manager.

The Osborn & Sexton Machinery Co., Columbus, Ohio, is in the market for 27 second-hand presses of different sizes and a 48-in. squaring machine.

The Columbia Chemical Co., Cleveland, incorporated with a capital stock of \$1,000,000, will erect a phosphate crushing mill near Columbia, Tenn., to have a capacity of 400 tons of rock per day. The company plans to manufacture acids. Rowland T. Meacham is president, and Wallace C. Baker, vice president.

The Toledo Cooker Co., 1336 West Bancroft Street, Toledo, has recently purchased an additional plant of 100,000 sq. ft. floor space in which it will employ between 250 and 300 workers.

William K. Stamets, Pittsburgh, announces the opening of an office in Cleveland, under the management of William S. Dickson, formerly general manager of the Greaves Klusman Tool Co., Cincinnati. The Stamets organization will represent exclusively the majority of high grade machine tool manufacturers that it now does in Pittsburgh.

Cincinnati

CINCINNATI, April 7.

The machine tool business seems to be slowing down somewhat. The foreign inquiry holds up well, but high freight rates are holding up orders. The ocean freight question is now seriously affecting makers of small machines, such as portable electric drilling and grinding machines; heretofore makers of heavy machine tools were the principal ones handicapped. Inquiries from Japan are increasing, but few orders have been placed within the past two weeks. It is reported that some cancellations have been received from Spain due to the high freight rates and slow movement of shipments from embarking ports. However, local firms were not involved, as far as can be ascertained.

The railroads are buying no machine tools, with the exception of a single one now and then which is needed for replacement. Second-hand machinery is slow and there is comparatively a small number of used tools on the market.

The jobbing foundries are not quite as busy as they were 30 days ago and some are only operating three days a week.

The Crystola Co., Cincinnati, maker of talking machines, will double the capacity of its plant at 314-316 Elm Street.

The Cincinnati Refining Co., Cincinnati, has been incorporated with \$250,000 capital stock by Allison Bishopprie, A. W. Williamson and others. The company expects to erect an oil refinery in Covington, Ky.

The Automatic Machine Co., 1150 West Second Street, Dayton, Ohio, has had plans prepared for a two-story addition to its plant.

The Dayton Pneumatic Tool Co., Dayton, is now occupying its new plant in Edgement. W. W. Price is president.

It has been reported that the Maxwell Motor Co., Dayton, will remove its No. 4 plant to Detroit before the end of the summer. Its other plants will remain in Dayton.

The Monitor Motor Car Co., Columbus, advises that it is not yet ready to go ahead in the construction of its proposed new plant, but plans will be ready in about 30 days. F. S. Cummins is general manager.

It is reported that the Baltimore & Ohio Railroad Co. will erect a shop at Zanesville, Ohio, to be used principally for repairing electrical equipment.

The Alvey-Ferguson Co., Oakley, Cincinnati, has increased its capital stock from \$500,000 to \$1,000,000. The company manufactures package-conveying outfits, and will increase its capacity at an early date.

The Reciprocating Electric Tool Co., Louisville, Ky., man-

manufacturer of electric-operated tools, has increased its capital from \$10,000 to \$100,000.

The Dixie Engine Co., Memphis, Tenn., has been incorporated with a capital of \$50,000 by E. H. Kimmons, Jr., D. L. Devere and A. M. Bradford to manufacture engines and other machinery.

Richard Carron & Sons, Ludlow, Ky., operating a local brass foundry, have increased their capital to \$50,000.

Chicago

CHICAGO, April 7.

An encouraging development is the action of the Government in shipping some machines used on war contracts to arsenals. Among the plants the equipment of which is being disposed of in this manner are the Miehle Printing Press Co., Chicago, and the Holt Co., Peoria, Ill. Although this move will keep the arsenals out of the machinery market to some extent for a time, it means that the industrial field will not be enabled to purchase used tools to the extent it might if all these machines were put on the open market. The Government's work on war claims also seems to have speeded up somewhat with the result that manufacturers are more hopeful of an early settlement than they have been heretofore.

Inquiries are numerous, particularly for large lathes and planers, but there is a tendency to defer buying on account of the Liberty Loan campaign and until claims against the Government are adjusted. The tractor and gas engine industries continue prominent among purchasers of such equipment as is being ordered. There has also been some buying by washing machine manufacturers, among them the Conlon Electric Washer Co., Chicago. The only new list reported is a small one, covering about \$15,000 worth of tools for a vocational school, which has been issued by the Chicago Board of Education.

In general, business in March was slightly less than that of either of the previous two months, but builders will not be dissatisfied if April is as good. Though deliveries of machines are fair, consumers still have to wait from 30 to 60 days for some tools, such as radial drills.

The Industrial Building Co., 38 South Dearborn Street, Chicago, will begin work soon on a three-story and basement factory to be erected in Chicago for the Century Rubber Tire Co. It will be of semi-mill construction with brick exterior, composition roof and steam heating equipment, and will cost \$75,000.

The American Wrench & Specialties Co., 610 South Dearborn Street, Chicago, has practically completed remodeling a building at 297 New Street, Blue Island, Ill., for use as a factory.

The Toombs Mfg. Co., Geneva, Ill., has been organized with a capital stock of \$15,000 to manufacture water heaters. The incorporators are Charles A. Olson, C. H. Toombs and Fred P. Toombs.

The Decatur Malleable Iron Works, Decatur, Ill., plans an addition to cost about \$100,000.

The Gary Screw & Bolt Works, Gary, Ind., suffered damage estimated at \$100,000 as the result of a fire which destroyed its electrical department.

The Gardner Machine Co. has started work on a concrete addition to its factory at South Beloit, Ill., to cost about \$2,000.

The Illinois Tractor Co., Bloomington, Ill., is planning for the erection of a new one-story plant, 40 x 100 ft.

The Indiana Refining Co., Lawrenceville, Ill., is completing plans for the erection of new one-story car and repair shops, 85 x 325 ft., to cost \$75,000.

The Iowa Valve Co., Oskaloosa, Iowa, is planning for the erection of a one-story addition, 40 x 125 ft.

The Pennsylvania Railroad, Union Station, Chicago, is planning for the erection of a new one-story repair shop, 50 x 70 ft., at Fourteenth and Canal streets, to cost \$40,000, including equipment.

The Hall Radio Corporation, Chicago, has been incorporated in Delaware with capital of \$400,000 by Samuel C. Wood and A. D. Suess, to manufacture wireless apparatus.

The Commercial Furniture Co., West Superior Street, Chicago, is planning for the immediate erection of a new three-story plant, 75 x 170 ft., to cost about \$75,000.

The Krasberg Mfg. Co., Orleans Street, Chicago, manufacturer of tools and machinery, has completed plans for the construction of a new seven-story plant, 100 x 200 ft., to cost about \$300,000.

St. Louis

ST. LOUIS, April 7.

The General Motors Corporation, Detroit, has announced definite decision to erect assembling plants at St. Louis for its Buick, Cadillac and Chevrolet divisions and has purchased a site of more than 100 acres. The fund set aside for these plants is in excess of \$4,000,000. The Marine & Hangar Co., New York, is in charge of plans, etc.

The International Aerial & Navigation Co., St. Louis, Thomas H. Keppel and C. J. Genterman interested, have leased space at 1030 North Vandeventer Avenue and will establish a plant to build aeroplanes.

The Town Council, De Ridder, La., will expend about \$90,000 for a pumping, light and power plant. E. A. Kramer, Magnolia, Miss., is engineer in charge.

The city of Gloster, Miss., has voted \$11,000 for burning engines for its electric light and water plant.

The Arkansas Valley Tractor Co., Newkirk, Okla., will install machine shop equipment and also machinery for assembling tractors. C. H. Reser is president and manager.

Armour & Co., Chicago, have leased a building and will equip a refrigerating plant at Clarksdale, Miss., requiring about \$25,000 worth of machinery.

The Harley Hardwood Co., Paris, Ark., will equip a plant requiring about \$50,000 worth of machinery and power equipment.

The St. Louis Wire & Iron Co., St. Louis, A. A. Marquardt engineer, will build an additional plant at once to cost about \$30,000.

The Dill Tractor Mfg. Co., Harrisburg, Ark., will equip a tractor plant at Little Rock, Ark., requiring about \$10,000 worth of machinery.

The Arkansas Truck & Body Co., Texarkana, Ark., will equip a plant for the manufacture of truck bodies, trailers, etc., and is in the market for machinery.

The National Shipbuilding Corporation, 202 Canal Bank Building, New Orleans, is receiving bids for the equipment of a plant on Lake Borgne Canal, including a \$1,000,000 dry dock. Equipment wanted includes rolls, drills, punches and other heavy machinery. W. J. Kelley, 42 Broadway, New York, is president.

T. H. Bourland, secretary waterworks District No. 1, Nashville, Ark., is in the market for pumping machinery, etc.

The city of Baton Rouge, La., will install a 5,000-gal. pump at the municipal waterworks.

A. E. Wright's cotton gin, England, Ark., has been destroyed with a loss of \$50,000. It will be rebuilt at once.

The National Grate Bar Co., American Trust Building, Birmingham, Ala., recently incorporated to manufacture grate bars and kindred products, has perfected an organization consisting of W. L. Rosamond, president; H. E. McCormack, vice-president; and R. D. Curry, treasurer. The local plant will consist of foundry and machine shop.

Indianapolis

INDIANAPOLIS, April 7.

The O'Brien Woven Lath Co., East Chicago, Ind., has been incorporated with a capital of \$125,000 by Karl D. Norris, George W. Roop and Henry W. Peterson, to manufacture wire lath, metal cloth, etc.

The Haynes Automobile Co., Kokomo, Ind., is taking bids for the erection of a four-story and basement addition, 150 x 500 ft., on Main Street, to be used as an assembling works.

The Victory Tractor Co., Greensburg, Ind., recently organized, has closed an agreement with the Mead-Davis Co., Chicago, for the output of its plant during the year. It is planned to develop a production of about 500 tractors in 1919, and to double this capacity next year.

The Mutual Truck Co., Sullivan, Ind., has awarded contracts to Shourds & McCormick, Terre Haute, and the Hoffman Construction Co., Evansville, for the erection of a factory, 100 x 200 ft., at a cost of about \$45,000.

The Delta Electric Co., Marion, Ind., which supplied a large part of the electric lighting apparatus used in the Army and Navy during the war, has plans for an addition to its plant for the manufacture of 15,000 dry cell batteries per day.

Fire, March 21, caused damage estimated at \$100,000 to the electrical department of the Gary Screw & Bolt Works, Gary, Ind.

Texas

AUSTIN, April 5.

The Houston-Guadalupe Water Power Co., Houston, has been incorporated with a capital of \$200,000 to develop water power on the Guadalupe River and to construct hydroelectric plants. The incorporators are H. A. Halverson, F. T. Beadle and L. C. Kolb, Houston, and others.

The Texas Gulf Refining & Pipe Line Co., Oildom, plans to build 1000-bbl. oil refinery at El Paso, in addition to those it is constructing at Oildom and Abilene.

The Miller Mfg. Co. has perfected plans for the construction of a cotton mill at Waco to cost \$800,000. C. R. Miller, Dallas, is president.

The Service Foundry Co., Beaumont, has been incorporated with a capital of \$10,000. The incorporators are Tom Rickby, T. H. Mabry and C. D. Mabry.

The Houston Ice & Brewing Co. will build a 60-ton ice plant and a refrigerating plant of 260,000 cu. ft. capacity at Galveston. David Rossi is local manager.

Canada

TORONTO, April 7.

Plans are being prepared by Alfred Chapman, architect, Harbor Commission Building, for the erection of a plant for the Canadian Ice Machine Co., Ltd., 82 Chestnut Street, Toronto, to cost \$40,000.

Plans are in progress and bids will be called about April 18 for the erection of a one-story concrete and brick factory to cost \$50,000 for the Auto Specialty Mfg. Co. of Canada, McDougall Avenue, Windsor, Ont. Davidson & Weiss, Chicago, Ill., are architects.

Plans have been prepared for electrically operating the plant of the Collingwood Shipbuilding Co., Collingwood, Ont. About 800 hp. will be required.

The Stamped Metal Products Co., of Canada, Ltd., Toronto, has been incorporated with a capital stock of \$6,000,000 by William A. J. Case, 801 Dominion Bank Building; George E. Atwood, James B. Taylor and others to manufacture castings, machinery, tools, etc.

The Halifax Shipyards, Ltd., Halifax, N. S., will start immediately on the erection of a plate mill to cost \$300,000 and a machine shop to cost \$70,000. The Bedford Construction Co. and Anglins, Ltd., Barrington Street, have the general contract.

The Sterling Rubber Co., Waterloo Avenue, Guelph, Ont., will build an addition to cost \$10,000. J. Abler is manager.

The Neptune Meter Co., New York, plans the erection of a three-story brick factory at Hamilton, Ont., to cost \$50,000. J. H. Ballantine is president.

The Four Wheel Drive Auto Co., Kitchener, Ont., will build a factory to cost \$200,000. E. C. Kabel, W. F. Barnes and S. J. Williams are directors.

Krug Brothers & Co., Ltd., Chesley, Ont., are in the market for a 100 hp. boiler and a hydraulic veneering press.

A. M. Crawford, Wingham, Ont., is in the market for a Greenard No. 3 arbor press.

R. A. Thompson, Lynden, Ont., is in the market for a power pump, with pulley drive, for pumping into tank 50-ft. high.

The Galt Art Metal Co., Ltd., Galt, Ont., plans the resumption of business on a pre-war scale and the employment of additional hands.

The Consolidated Stamping & Enameling Co., 2382 Dundas Street West, Toronto, will install three furnaces and two anodes in connection with its plant.

The Sellers Kitchen Cabinet Co. of Canada, Southampton, Ont., is in the market for a 15 hp. three-phase 60-cycle 220-volt electric motor with starter.

The Peter Hamilton Co., Ltd., Peterborough, Ont., is in the market for an engine lathe, 10 x 18 in.

A. M. Shaver, Ancaster, Ont., is in the market for a 25-hp stationary steam engine.

Plans are prepared for the erection of a plant at Montreal for the Montreal Portland Cement Co., Ltd. Robert Dodds is representative.

The H. M. Lane Co., Ltd., Windsor, Ont., has been incorporated with a capital stock of \$10,000 by Henry M. Lane, Highland Park, Mich.; Benjamin Towlen and Charles R. Seabrook, both of Detroit, Mich.; David W. F. Nichols of Windsor, and others to manufacture machinery, tools, etc.

The A. R. Williams Machinery & Supply Co., Ltd., Montreal, has been incorporated with a capital stock of \$500,000 by Gerald A. Coughlin, Francis G. Bush, George R. Drennan

and others to manufacture machinery, tools, boilers, engines, etc. The company is also located at 64 Front Street West, Toronto.

It is reported that the General Motors Corporation, Detroit, will remove the plant of the McLaughlin-Buick Co., Brockville, Ont., a subsidiary, to Walkerville, Ont., and that approximately \$6,000,000 will be spent on expanding the plant.

The plant of the Canadian Steel Foundries, Welland, Ont., has closed for an indefinite period owing to lack of orders, and all foundry work will be carried out at the company's plant at Longue Pointe, Que. R. S. Hart is manager.

The Day Name Plate Co., 126 Garden Avenue, Toronto, is in the market for a power or foot squaring shears, 36-in. or less.

H. E. Ratz & Co., Millbank, Ont., are in the market for a 25 hp. locomotive boiler.

The Pacific Coast

SAN FRANCISCO, April 1, 1919.

While there is a falling off in the sale of machinery in this district, confidence is manifested by the fact that the shipyards are still buying for future delivery. Several orders were given for heavy machinery the past week for delivery in 90 days and no curtailing of the industry is looked for at present.

Considerable inquiry for iron and steel and machinery for export to Java developed the past week.

The San Francisco Open Dry Dock Co. has been incorporated with a capital of \$2,000,000 with the following directors: H. Kearney, M. G. Parker, P. H. Kearney, J. W. Machado, A. T. Briggs, P. R. Breen and I. L. Steinman. It is said that the erection of the main building on a site at the north end of the transport docks of the city will begin at once.

John Collins, who has been operating a machine shop in the Marysville Foundry, Marysville, Cal., has made arrangements to build a new shop and foundry at another location in Marysville.

Kay, Moore & Noble have let a contract for the erection of a one-story foundry at Connecticut and Seventeenth streets, San Francisco, at a cost of \$17,000.

The Alaska Packers' Association is negotiating with the Government to buy the site of the proposed Liberty shipyards, Alameda, which is adjacent to property now owned by the association. If the negotiations are successful it is planned to build extensive ship repair shops on the site to take care of its fleet.

The Crowley Launch & Towboat Co., San Francisco, is backing a plan to build high-powered seaplanes at its plant at Oakland which will be enlarged and in charge of H. E. Christenson, recently of the Canadian Flying Corps.

The Washington Sheet Metal Works, Seattle, plans the erection of a new factory, 60 x 121 ft., on Westlake and Galer streets.

O. C. Fenalson, Portland, Ore., has taken over the plant of the Pacific Wood Package Co., Raymond, Wash. Important changes in the plant will be made, including the installation of considerable new equipment.

The Chehalis Machine Works, Chehalis, Wash., plans a number of improvements to double its present capacity, including a new foundry for making large and small castings, and a pattern shop. Harry Alldis is the owner.

The Prince Rupert Dry Dock & Engineering Co., which recently took over under lease from the Grand Trunk Pacific Railway the shipbuilding plant and drydock at Prince Rupert, B. C., will enlarge the plant as business develops. The drydock is the largest sectional dock on the Pacific Coast. The company is entering upon the construction of two 8100-ton steel freighters of the Dominion standard which will necessitate the employment of a large number of men. Newman Erb is chairman of the board, and John L. Millon, president, is directing the organization work.

Government Purchases

WASHINGTON, April 7.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, for supplies for the naval service as follows: Schedule 3882, 1 motor-driven cold-metal sawing machine for Norfolk; schedule 3884, 1 14-in. sensitive vertical drill, 1 24-in. automatic knife grinder, 1 14-in. variety saw, all for San Diego, Cal.

Current Metal Prices

On Small Lots, from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

Iron and Soft Steel Bars and Shapes

Per lb.

Bars:

Refined iron, base price	3.37c
Burden's H. B. & S. bar iron, base price.....	6.30c
Burden's best bar iron, base price.....	6.50c
Swedish bars, base price.....	20.00c

Soft Steel:

¾ to 1½ in., round and square.....	3.37c
1 to 6 in. x ¾ to 1 in.....	3.37c
1 to 6 in. x ¼ and 5/16.....	3.47c

Rods—¾ and 11/16.....3.42c

Bands—1½ to 6 x 3/16 to No. 8.....4.07c

Shapes:

Beams and channels—3 to 15 in.....3.47c

Angles:

3 in. x ¼ in. and larger.....	3.47c
3 in. x 3/16 and ¼ in.....	3.72c
1½ to 2½ in. x ¼ in.....	3.52c
1½ x 2¾ in. x 3/16 in. and thicker.....	3.47c
1 to 1¼ in. x 3/16 in.....	3.52c
1 to 1¼ in. x ¼ in.....	3.57c
¾ x ¾ x ¼ in.....	3.62c
¾ x ¾ in.....	3.67c
¾ x ¼ in.....	4.47c
½ x 3/32 in.....	5.17c

Tees:

1 x ¾ in.....	3.87c
1¼ in. x 1¼ x 3/16 in.....	3.77c
1½ to 2½ x ¼ in.....	3.57c
1½ to 2½ x 3/16 in.....	3.57c
3 in. and larger.....	3.52c

Merchant Steel

Per lb.

Tire, 1½ x ½ in. and larger.....	3.37c
Toe calk, ½ x ¾ in. and larger.....	4.72c
Open-hearth spring steel.....	6.50c
Standard cast steel, base price.....	15.00c
Extra cast steel.....	18.00 to 20.00c
Special cast steel.....	23.00 to 25.00c

Tank Plates—Steel

Per lb.

¾ in. and heavier.....	3.67c
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Sheets

Blue Annealed

Per lb.

No. 8 and 3/16 in.....	4.52c
No. 10	4.55c to 4.57c
No. 12	4.60c to 4.62c
No. 14	4.65c to 4.67c
No. 16	4.75c to 4.77c

Box Annealed—Black

Soft Steel Wood's
C. R., One Pass, Refined,
per lb. per lb.

Nos. 18 to 20.....	5.30c to 5.50c	
Nos. 22 and 24.....	5.35c to 5.55c	7.62c
No. 26.....	5.40c to 5.60c	7.67c
No. 28.....	5.50c to 5.70c	7.82c
No. 30.....	5.70c to 5.90c	
No. 28, 36 in. wide, 10c higher.		
Genuine Russia, as per assortment.....	22½ @ 25c	
Woods Keystone Hammered, 18-24 gage, 10c.; 26-28 gage, 11c.		

Galvanized

Per lb.

No. 14	5.60c to 5.80c
No. 16	5.75c to 5.95c
Nos. 18 and 20.....	5.90c to 6.10c
Nos. 22 and 24.....	6.05c to 6.25c
No. 26	6.20c to 6.40c
No. 27	6.35c to 6.55c
No. 28	6.50c to 6.70c
No. 30	7.00c to 7.20c
No. 28, 36 in. wide, 20c. higher.	

Corrugated Roofing, Galvanized

2½ in. corrugations, 10c. per 100 lb. over flat sheets.

On a number of articles the base price only is given it being impossible to name every size.

The wholesale prices at which large lots are sold to manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general headings of "Iron and Steel Markets" and "Metal Markets."

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER

Bright basic	5.50c
Annealed soft	5.50c
Galvanized annealed	6.50c
Coppered basic	6.50c
Tinned soft bessemer.....	7.50c

*Regular extras for lighter gages.

Brass Tubes, Rods and Wire, and Copper Tubes

Manufacturers have withdrawn all quotations because of unsettled prices of raw materials and will only name prices to actual buyers.

Copper Sheets

Sheet copper, hot rolled, 16 oz., 22½c. to 24½c. per lb. Cold rolled, 14 oz. and heavier, 1c. per lb. advance over hot rolled.
Polished, 20 in. wide and under, 1c. per sq. ft. extra over 20 in. wide, 2c. per sq. ft. extra.
Planished copper, 1c. per sq. ft. more than polished.
Tinning, one side, 5c. per sq. ft.

Tin Plates

Bright Tin	Grade "AAA" Charcoal	Grade "A" Charcoal	Coke—14x20	Primes	Wastes
	14x20	14x20	80 lb. ...	\$8.30	\$8.50
			90 lb. ...	8.40	8.50
			100 lb. ...	8.55	8.50
IC ..	\$11.30	\$10.05	IC ...	8.80	8.50
IX ..	13.50	12.00	IX ...	10.00	9.50
IXX ..	15.25	13.75	IXX ...	10.95	10.50
IXXX ..	17.00	15.50	IXXX ...	11.90	11.50
IXXXX ..	18.75	17.25	IXXXX ...	12.85	12.50

Terne Plates

5-Lb. COATING 14x20

100 lb.	\$8.50
IC	8.50
IX	9.50
Fire door stock	11.50

Tin

Straits pig	74c to 76c
Bar	85c to 90c
American pig, 99 per cent.....	70c to 72c

Copper

Lake Ingot	18c to 19c
Electrolytic	17c to 18c
Casting	16½c to 17½c

Spelter and Sheet Zinc

Western spelter	9c to 10c
Sheet zinc, No. 9 base, casks.....	12c; open 14c

Lead and Solder*

American pig lead.....	6½c to 7c
Bar lead	7½c to 8c
Solder ½ & ½ guaranteed.....	8c
No. 1 solder	8c
Refined solder.....	8c

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.....	8c
Commercial grade, per lb.....	7c

Antimony

Asiatic	8c
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Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.	37c to 38c
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Old Metals

There is more activity, though holders of metal are inclined to keep what they have for higher prices. Dealers' buying prices are nominally as follows:

Copper, heavy and crucible.....	12c
Copper, heavy and wire.....	12c
Copper, light and bottoms.....	10c
Brass, heavy	6c
Brass, light	5c
Heavy machine composition.....	12c
No. 1 yellow rod brass turnings.....	10c
No. 1 red brass or composition turnings.....	10c
Lead, heavy	4c
Lead, tea	4c
Zinc	4c

